Vol. 1004 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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March 17, 1981

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the list of PCT member countries and the most recent PCT rule changes see the notice appearing at 1001 O.G. 14 in the OFFICIAL GAZETTE of Dec. 9, 1980.

Note that the international fees have been increased as of Jan. 1, 1981. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	$300.00
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Basic supplemental fee (for each sheet over 30)	$ 5.00
Designation fee	$ 64.00

SIDNEY A. DIAMOND,
Jan. 13, 1981. *Commissioner of Patents and Trademarks.*

Trademark Opposition and Cancellation Proceedings: Compulsory Counterclaims

37 CFR Part 2

CORRECTION

In FR Doc. 81-1576, published on page 6934, in the issue of Thursday, Jan. 22, 1981, make the following corrections:

1. On page 6940, second column, § 2.114(b)(2)(i), change the period at the end of the twelfth line to a comma, and lower case the first word of the thirteenth line.

2. On the same page, § 2.114(b)(2)(ii), in the first line in the third column, the word "if" should read "is."

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,347,691, Re. S.N. 161,629, Filed Jun. 26, 1980, Cl. 430/121, XEROGRAPHIC DEVELOPMENT, James M. Lyles, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: H. M. Brownrout, et al., Ex. Gp.: 166

3,821,763, Re. S.N. 200,041, Filed Oct. 23, 1980, Cl. 354/94, ANNULAR FIELD OPTICAL IMAGING SYSTEM, Roderic M. Scott, Owner of Record: *The Perkin-Elmer Corporation, Norwalk, Conn.,* Attorney or Agent: John B. Young, Ex. Gp.: 211

4,076,698, Re. S.N. 198,832, Filed Oct. 20, 1980, Cl. 526/348.6, HYDROCARBON INTERPOLYMER COMPOSITIONS, Arthur W. Anderson, et al., Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Roger A. Hines, Ex. Gp.: 144

4,080,940, Re. S.N. 212,294, Filed Dec. 2, 1980, Cl. 123/117 D, ENGINE CONTROL, Joe E. Fuzzell, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Frank L. Hart, Ex. Gp.: 342

4,152,460, Re. S.N. 209,181, Filed Nov. 21, 1980, Cl. 424/330, 3-CHLORO-2,6-DINITRO-N-(SUBSTITUTED PHENYL)-4-(TRIFLUOROMETHYL) BENZENAMINES, Barry A. Dreikorn, Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, Ex. Gp.: 125

4,188,354, Re. S.N. 200,609, Filed Oct. 24, 1980, Cl. 264/22, METHOD FOR THE PREPARATION OF ASYMMETRICAL MEMBRANES, Stelio Munari, et al., Owner of Record: *Techneco S.P.A., Fano (Pesaro), Italy,* Attorney or Agent: George B. Finnegan, Jr., et al., Ex. Gp.: 147

4,189,524, Re. S.N. 168,048, Filed Sep. 10, 1980, Cl. 428/622, STRUCTURE FOR MULTILAYER CIRCUITS, Jean-Pierre Lazzari, Owner of Record: *Compagnie Internationale Pour L'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France,* Attorney or Agent: Edward J. Kondracki, Ex. Gp.: 111

Availability of Patent and Trademark Office Notices on a Subscription Basis

Effective Mar. 3, 1981, a separate publication of a part of the OFFICIAL GAZETTE to be entitled *Patent and Trademark Office Notices,* will be made available on a subscription basis. This weekly periodical will contain all notices which appear in the Patent OFFICIAL GAZETTE and the Trademark OFFICIAL GAZETTE. Additionally, current information regarding the general date status of trademark and patent applications will be provided.

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RENE D. TEGTMEYER,
Feb. 10, 1981. *Acting Commissioner of Patents and Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Mar. 17, 1981

Re. 29,043	4,216,740	4,230,744	4,236,976
D. 256,318	4,217,008	4,230,830	4,237,007
3,556,844	4,217,208	4,230,845	4,237,075
3,884,119	4,218,744	4,231,411	4,237,185
4,075,290	4,220,427	4,231,619	4,237,442
4,080,319	4,220,529	4,231,674	4,237,517
4,086,594	4,221,584	4,231,756	4,237,596
4,110,518	4,221,695	4,232,018	4,237,801
4,140,867	4,221,795	4,232,133	4,237,833
4,142,319	4,221,838	4,232,248	4,237,973
4,142,979	4,222,105	4,232,497	4,238,103
4,144,073	4,222,489	4,232,638	4,238,204
4,150,005	4,223,658	4,232,784	4,238,465
4,160,257	4,224,386	4,232,797	4,238,481
4,170,636	4,224,989	4,233,058	4,238,483
4,175,961	4,225,446	4,233,513	4,238,799
4,177,157	4,225,488	4,233,629	4,239,015
4,178,849	4,225,489	4,233,703	4,239,182
4,185,397	4,225,958	4,233,921	4,239,192
4,185,520	4,226,402	4,233,925	4,239,256
4,188,807	4,226,494	4,233,957	4,239,363
4,190,566	4,226,741	4,234,146	4,239,481
4,192,808	4,226,756	4,234,334	4,239,722
4,195,979	4,226,921	4,234,636	4,240,474
4,196,937	4,227,573	4,234,657	4,240,525
4,201,328	4,227,680	4,234,841	4,240,669
4,202,040	4,228,177	4,235,509	4,240,678
4,206,235	4,228,340	4,235,609	4,240,946
4,207,413	4,228,704	4,235,808	4,241,142
4,209,377	4,228,767	4,236,160	4,241,225
4,210,872	4,229,603	4,236,177	4,242,405
4,211,692	4,229,750	4,236,334	4,242,495
4,211,773	4,229,754	4,236,632	4,242,643
4,212,091	4,229,844	4,236,689	4,244,064
4,215,219	4,230,368	4,236,780	4,244,395
4,215,412	4,230,557	4,236,911	4,244,996
4,216,214	4,230,688	4,236,912	

Erratum

All reference to Patent No. 4,246,372, to Floyd E. Naylor, of Oklahoma, for CONVERSION OF ALPHA-METHYLSTYRENE-TYPE MONOMERS IN THE FORMATION OF COPOLYMERS WITH CONJUGATED DIENE MONOMERS, appearing in the OFFICIAL GAZETTE, of Jan. 20, 1981, should be deleted since no patent was granted.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D444,
Pentagon, Washington, D.C. 20310

Patent application 6-104,499. Preparation of TNT-Thermoplastic Polymer Granules Readily Soluble in a TNT Melt. Filed Dec. 17, 1979.

Patent application 6-119,274. Directional Two-Axis Differential Optical Inclinometer. Filed Feb. 7, 1980.

Patent application 6-119,275. Directional Two Axis Optical Inclinometer. Filed Feb. 7, 1980.

Patent application 6-122,639. A Fuze Data Quantizing System. Filed Feb. 19, 1980.

Patent application 6-122,780. Method and Apparatus for Calibrating Gyroscopically-Stabilized, Magnetically Slaved Heading Reference System. Filed Feb. 19, 1980.

Patent application 6-126,803. Fatigue Cycle Sensor. Filed Mar. 3, 1980.

Patent application 6-126,804. Multiple Wedge Element Lens for an Ultrasonic Inspection Transducer. Filed Mar. 3, 1980.

Patent application 6-127,331. Precision Optical Inclinometer. Filed Mar. 3, 1980.

Patent application 6-133,064. Recoil Buffer. Filed Mar. 24, 1980.

Patent application 6-134,680. Cable Guide for Powered Winch. Filed Mar. 28, 1980.

Patent application 6-136,124. Composite Cored Combat Vehicle Armor. Filed Mar. 31, 1980.

Patent application 6-138,967. Radiation Energy Detector and Analyzer. Filed Apr. 10, 1980.

Patent application 6-140,369. High Rate Carbon Cathode, Method of Making, and Electrochemical Cell Including the Cathode. Filed Apr. 14, 1980.

Patent application 6-145,934. Method of Treating Sm_2Co_{17}-Based Permanent Magnet Alloys. Filed May 12, 1980.

Patent application 6-148,112. Multipath Discriminating Antenna System. Filed May 9, 1980.

Patent application 6-148,114. Method of Sweeping Quartz. Filed May 9, 1980.

Patent application 6-148,324. Pulse Train Generator of Predetermined Pulse Rate Using Feedback Shift Register. Filed May 9, 1980.

Patent application 6-148,426. Muzzle Position Sensor. Filed May 9, 1980.

Patent application 6-150,872. Bump Stop for Trunnion-Mounted Weapon. Filed May 19, 1980.

Patent application 6-152,261. Method of Delineating a Desired Integrated Circuit Pattern Upon a Circuit Substrate. Filed May 22, 1980.

Patent application 6-152,287. Method of Selectively Etching a Semiconductor Substrate. Filed May 22, 1980.

Patent application 6-152,920. Shaft-Component Connection Means. Filed May 23, 1980.

Patent application 6-155,334. Improved Dual-Chambered High Pressure Furnace. Filed June 2, 1980.

Patent application 6-155,340. Mechanism for Removing Dust Particles From an Engine Air Cleaner. Filed June 2, 1980.

Patent application 6-155,341. Articulation Joint Roll Stabilizer. Filed June 2, 1980.

Patent application 6-159,407. Inverter Circuit With Current Equalization. Filed June 13, 1980.

Patent application 6-159,539. Radar Target Angle Measuring System. Filed June 16, 1980.

Patent application 6-160,349. False Count Correction in Feedback Shift Registers and Pulse Generators Using Feedback Shift Registers. Filed June 17, 1980.

Patent application 906,187. Bonding Plastic Layers. Filed May 15, 1978.

Patent 4,203,115. Zero-Doppler Shift Positioning Technique. Filed Oct. 11, 1973. Patented May 13, 1980. Not available NTIS.

Patent 4,218,737. Revenue Metering System for Power Companies. Filed Aug. 30, 1977. Patented Aug. 19, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20234

Patent application 6–161,185. Microwave Power Level Stabilizing Circuit for Cesium Beam Frequency Standards. Filed June 19, 1980.

Patent application 6–163,134. Symmetrical Diphosphatetraazacyclooctatetraenes. Filed June 26, 1980.

Patent application 6–163,135. Unsymmetrical Diphosphatetraazacyclooctatetraenes. Filed June 26, 1980.

Patent application 6–169,020. Temperature Sensing Assembly. Filed July 15, 1980.

Patent 4,215,634. Mechanical Munition Flight Environment Sensor. Filed July 26, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,216,338. Synthesis of Fluorocarbon Esters. Filed June 8, 1979. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,216,723. Bomblet Fuze. Filed May 31, 1977. Patented Aug. 12, 1980. Not available NTIS.

Patent 4,218,928. Double Acting Delay Mechanism. Filed Jan. 5, 1979. Patented Aug. 26, 1980. Not available NTIS.

Patent 4,219,845. Sense and Inject Moving Target Indicator Apparatus. Filed Apr. 12, 1979. Patented Aug. 26, 1980. Not available NTIS.

Patent 4,219,936. Hole Angularity Gage. Filed Sept. 19, 1979. Patented Sept. 2, 1980. Not available NTIS.

Patent 4,220,750. Thermally Stable Aromatic Enyne Polyimides. Filed Apr. 24, 1978. Patented Sept. 2, 1980. Not available NTIS.

Patent 4,222,745. Indicator for Detection of SO_2 Leakage. Filed Nov. 8, 1978. Patented Sept. 16, 1980. Not available NTIS.

Patent 4,224,388. Hydraulic Seal Battery Terminal. Filed Aug. 28, 1979. Patented Sept. 23, 1980. Not available NTIS.

Patent 4,224,515. High Accuracy Optical Shaft Encoder System. Filed Oct. 27, 1978. Patented Sept. 23, 1980. Not available NTIS.

Patent 4,224,558. Selectable Servo Ratio and Dual Speed Control System for Large Centrifuge Units. Filed Jan. 10, 1978. Patented Sept. 23, 1980. Not available NTIS.

Patent 4,224,607. Intruder Detector System Having Improved Uniformity of Detection Sensitivity. Filed June 25, 1979. Patented Sept. 23, 1980. Not available NTIS.

Patent 4,224,768. Apparatus for, and Method of, Plunge Grinding. Filed Dec. 5, 1978. Patented Sept. 30, 1980. Not available NTIS.

Patent 4,225,016. Hydraulic Decelerator With Segmented Cylinder. Filed Feb. 26, 1979. Patented Sept. 30, 1980. Not available NTIS.

Patent 4,225,101. Aircraft Ejection System Collision Avoidance System. Filed Jan. 9, 1979. Patented Sept. 30, 1980. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 6–107,741. Porous Electrolyte Retainer for Molten Carbonate Fuel Cell. Filed Dec. 27, 1979.

Patent application 6–107,791. Direct Contact, Binary Fluid Geothermal Boiler. Filed Dec. 27, 1979.

Patent 4,209,236. Solar Central Receiver Heliostat Reflector Assembly. Filed Oct. 21, 1977. Patented June 24, 1980. Not available NTIS.

Patent 4,209,552. Thin Film Deposition by Electric and Magnetic Crossed-Field Diode Sputtering. Filed Dec. 18, 1978. Patented June 24, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Director, Navy Patent Program/Patent Counsel for the Navy
Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 6–155,877. Polymer Modified TNT Containing Explosives. Filed June 2, 1980.

Patent application 6–157,770. Target Acquisition Apparatus. Filed June 9, 1980.

Patept application 6–165,166. Improved Gas Generant Propellants. Filed July 1, 1980.

Patent application 6–170,355. A Thixotropic Restrictor, Curable at Room Temperature, for Use on Solid Propellant Grains. Filed July 21, 1980.

Patent application 6–180,538. Laser Beam Directional Deviation and Noise Stabilization Device. Filed Aug. 22, 1980.

Patent application 6,180,547. Ferrofluid Transducer. Filed Aug. 25, 1980.

Patent application 6–180,548. Low Sidelobe Linear FM Chirp System. Filed Aug. 25, 1980.

Patent application 6–184,823. Propulsion/Control Modular Booster. Filed Sept. 8, 1980.

Patent application 6,185,039. Surface Hardening by Particle Injection Into Laser Melted Surface. Filed Sept. 8, 1980.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–4, Washington, D.C. 20546

Patent application 6–175,452. Phosphorus-Containing Bismide Resins. Filed Aug. 5, 1980.

Patent 4,215,548. Free-Piston Regenerative Hot Gas Hydraulic Engine. Filed Oct. 12, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,216,186. Means for Growing Ribbon Crystals Without Subjecting the Crystals to Thermal Shock-Induced Strains. Filed Aug. 31, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,217,165. Method of Growing a Ribbon Crystal Particularly Suited for Facilitating Automated Control of Ribbon Width. Filed Apr. 28, 1978. Patented Aug. 12, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 29, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus: Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-23-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-10-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-11-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	12-12-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-5-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-8-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-0-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-21-78
DESIGNS, GROUP 290—Vacant Industrial Arts; Household, Personal and Fine Arts.	1-8-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-18-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-20-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-1-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-1-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during November 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,109,176 to 3,112,486, inclusive
Plant Patents ..... Numbers 2,295 to 2,323, inclusive

REISSUES

MARCH 17, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,547

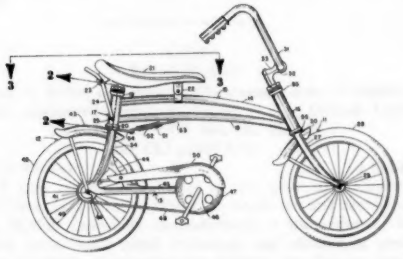
BICYCLE WITH A PIVOTABLE REAR WHEEL

Ralph A. Belden, Spokane, Wash., assignor to Professional Management Associates, Logan, Utah

Original No. 3,801,130, dated Apr. 2, 1974, Ser. No. 291,953, Sep. 25, 1972. Continuation of Ser. No. 74,688, Sep. 23, 1970, abandoned. Application for reissue Jan. 9, 1978, Ser. No. 867,795

Int. Cl.[3] **B62K** *21/10, 25/00*

U.S. Cl. 280—240 **3 Claims**



1. A bicycle comprising:

a rigid upright main frame having front and rear ends;

a saddle [fixidly] mounted to said main frame for support of a rider;

a front fork journalled [intermediate] *at* its upper [and lower ends] *end* about a first upright axis at the front end of the main frame, said front fork having a front wheel rotatably mounted to its lower end;

a handlebar assembly fixed to the upper end of said front fork;

a rear fork journalled at its upper end about a second upright axis at the rear end of the main frame, said rear fork having a rear wheel rotatably mounted to its lower end about a rear wheel axis;

a rigid pedal frame fixed to the rear fork and extending outwardly therefrom alongside said rear wheel;

foot-operated pedal means movably mounted to the outer end of said pedal frame, said pedal means being drivingly connected to said rear wheel for turning said rear wheel about said rear wheel axis;

said rear fork being free to move about said second upright axis independently of movement of said front fork about said first upright axis;

the angular position of the front fork relative to the main frame about said first upright axis being controllable by the hands of the rider through the handlebar assemblies;

the angular position of the rear fork relative to the main frame about said second upright axis being controllable by the feet of the rider through the pedal means and pedal frame independently of the angular position of the front fork about said first axis.

Re. 30,548

PEPTIDES WHICH EFFECT RELEASE OF HORMONES

Wylie W. Vale, Jr.; Jean E. F. Rivier, both of La Jolla, and Marvin R. Brown, Del Mar, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Original No. 4,105,603, dated Aug. 8, 1978, Ser. No. 781,580, Mar. 28, 1977. Application for reissue Aug. 31, 1979, Ser. No. 71,559

Int. Cl.[3] **C08L** *37/00;* **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 260—8 **7 Claims**

1. A peptide selected from those of the formulae:

I

$$Cys—R_1—Phe—Phe—R_2—Lys—R_3—Phe—R_4—R_5—Cys$$

II

$$Cys—R_1—Phe—Phe—R_2—Lys—R_3—Phe—R_4—R_5—Cys$$

III

$$X—Cys—(X^1)—R_1—Phe—Phe—R_2—Lys(X^2)—R_3(X^3)—Phe—R_4(X^4)—R_5(X^5)—Cys(X^6)—R_6$$

wherein R_1 is selected from the group consisting of Asn and desR_1; R_2 is selected from the group consisting of Trp and D-Trp; R_3 is selected from the group consisting of Phe and Thr; R_4 is selected from group consisting of Thr and desR_4; R_5 is selected from the group consisting of Ser, Phe and desR_5, provided that at least one of R_1, R_4 and R_5 is deleted; X is selected from the group consisting of H, and an alpha-amino protecting group; X^1 and X^6 are selected from the group consisting of H and a protecting group for Cys selected from S-p-methoxybenzyl, S-acetamidomethyl, S-trityl and S-benzyl; X^2 is selected from the group consisting of H and a side chain amino protecting group; X^3, X^4 and X^5 are selected from the group consisting of H and a hydroxyl protecting group selected from the group consisting of acetyl, benzoyl, tert-butyl, trityl, benzyl and benzyloxycarbonyl; with the proviso that at least one of X, X^1, X^2, X^3, X^4, X^5, and X^6 is other than hydrogen; [and] R_6 is selected from the group consisting of hydroxy, methoxy, and an anchoring bond used in solid phase synthesis linked to a solid resin support selected from the group consisting of —O—CH_2-polystyrene resin support and O—CH_2-benzylpolystyrene resin support; *and Cys is either L-Cys or D-Cys.*

PLANT PATENTS

GRANTED MARCH 17, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,669
ROSE PLANT

Samuel McGredy, IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jan. 17, 1980, Ser. No. 112,750
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—2 **1 Claim**

1. A new and distinct variety of rose plant of the climber class, substantially as herein shown and described, said plant being especially characterized by the vigor of its growth habit, the abundance of its foliage, and most particularly by the bi-color effect of its flowers, which are of double petalage, a coloration dominated by bright orange, intermixed with white, said flowers being borne mostly in clusters of five or more to a stem.

4,670
ROSE PLANT

Herbert C. Swim, and Jack E. Christensen, both of Ontario, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 26, 1979, Ser. No. 106,723
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid grandiflora class, substantially as herein shown and described, being further especially characterized in the vigor of its growth habit, being much branched, and clothed in semi-glossy relatively disease-resistant foliage, the flowers being off-white in coloration, well-formed, and of a strong citrus fragrance.

4,671
ROSE PLANT

Georges Delbard, Paris, France, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 28, 1979, Ser. No. 108,159
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid Tea class, substantially as herein shown and described, being particularly characterized in the relatively uniform coloration of its light-lavender, well formed medium large blooms, which are borne mostly in clusters on long, strong stems and by a strong fragrance, a blend of citrus and tea, the plant being further characterized in its vigorous new growth and large leaves, bearing almost throughout the growing season.

4,672
ROSE PLANT

Reimer Kordes, Aspern, Fed. Rep. of Germany, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 19, 1979, Ser. No. 105,782
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—27 **1 Claim**

1. A new and distinct variety of Floribunda rose plant, substantially as herein shown and described, and being especially characterized in the distinctive purple-red coloration of its blooms, and in the abundance of its dark green glossy foliage, which covers the plant during the growing season.

4,673
APRICOT TREE

Richard Peters, P.O. Box 907, Fresno, Calif. 93714

Filed Oct. 5, 1979, Ser. No. 82,160
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree substantially as illustrated and described which is characterized by branches which are relatively more brown and less red in color than the branches of other apricot trees, which bears fruit of uniformly truncated shape having uneven sides, which is of large size, which is early ripening, approximately with the Pomo, is of good eating quality resembling the Lulu Belle and Early Perfection; and is particularly characterized by the good holding quality of the fruit before harvest as well as during packing, shipping and display for sale.

4,674
NECTARINE TREE

Hajime Hamada, Kingsburg, Calif., assignor to Robert M. Hamada and Lindsay K. Hamada, both of Kingsburg, Calif.

Filed Nov. 23, 1979, Ser. No. 96,987
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, broadly characterized by bearing yellow-fleshed fruit of large size and by its general resemblance to the Sun Grand Nectarine Tree (U.S. Plant Pat. No. 974) of which it is believed to be a mutant but from which it is distinguished as to novelty by its fruit attaining an overall full red coloration even along its suture without overall exposure to sun, and by its fruit ripening substantially all at the same time and about one week earlier than the fruit of the Sun Grand.

PATENTS

GRANTED MAR. 17, 1981

ERRATA

For CLASS	See PATENT NO.
434–308	4,255,872
434–082	4,255,873
064–021	4,255,943
411–518	4,256,010
493–266	4,256,023
493–343	4,256,024
493–160	4,256,025
493–404	4,256,026
493–011	4,256,027
493–287	4,256,028
137–625.31	4,256,163
221–026	4,256,237
221–263	4,256,238
369–217	4,256,310
369–170	4,256,311
369–269	4,256,312
351–160 H	4,256,369
062–538	4,256,576
564–018	4,256,661
564–067	4,256,662
564–188	4,256,663
564–177	4,256,664
564–135	4,256,665
564–135	4,256,666
564–384	4,256,667
564–255	4,256,668
564–434	4,256,669
564–416	4,256,670
564–422	4,256,671
422–004	4,256,728
422–197	4,256,783
428–216	4,256,784
370–104	4,256,925

PATENTS

GRANTED MARCH 17, 1981

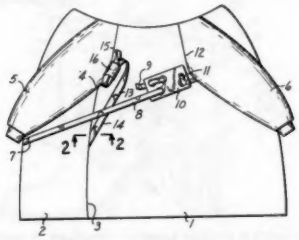
GENERAL AND MECHANICAL

4,255,817
HEAT INSULATIVE MATERIAL ARTICLES COMPRISING ARAMID FIBERS
John N. Heim, 10183 Amestoy St., Granada Hills, Calif. 91344
Filed Jan. 29, 1979, Ser. No. 7,356
Int. Cl.³ A41D *13/00, 13/04;* **A62B** *17/00;*
U.S. Cl. 2—2 **4 Claims**

1. A protective covering, apron or garment comprising the combination: a first portion comprising a layer of woven synthetic fabric of an organic fiber of copolyamide having the structure:

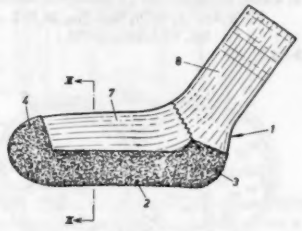
and a second portion of a like fiber having a coating of fire-resistant neoprene thereon, said first portion being fabricated of closely interwoven fibers and said second portion being fabricated of punched fibers forming a low density, high bulk flannel and wherein said first portion is at least 0.005 inch thick and said second portion is within the range of 0.150–0.155 inch thick and said coating is within the range of about 0.005–0.010 inch thick.

4,255,818
BACK OPENING SURGICAL GOWN
Donald J. Crowley, Sudbury, Mass., and Jimmy E. McLaughlin, El Paso, Tex., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 6, 1979, Ser. No. 64,228
Int. Cl.³ A41B *13/10, 9/00*
U.S. Cl. 2—51 **25 Claims**



1. A back opening surgical gown of seamed construction which includes a front section and two sleeves wherein the improvement comprises: a wrap panel with outer and inner edges, the inner edge being joined to the front section at a side seam; a wrap belt having a first end secured to the gown adjacent the outer edge of the wrap panel and a second end removably held by a belt release means secured to a gown seam at a location spaced from a wrap belt's first end; a tie strap having a first end secured in the side seam and a second end removably held by a tie release means secured to a gown seam at a location spaced from the strap's first end.

4,255,819
SOCK
Bengt G. E. Klingspor, Brämhult, Sweden, assignor to AB Eiser, Boras, Sweden
Filed Apr. 25, 1979, Ser. No. 33,146
Int. Cl.³ A41B *11/02*
U.S. Cl. 2—239 **3 Claims**



1. An improved sock, particularly intended for sports activities, the improvement comprising

the body of said sock being knitted from a yarn of textile fibres that do not lend themselves to felting,

a yarn consisting of feltable textile fibres knitted into the fibres of said sock on the opposite side of said sole, heel, and toe regions of said sock, said yarn forming loop pile meshes, and

said feltable fibres of said yarn knitted into said sole, heel, and toe regions of said sock being felted and thus form soft layers of fibres on the inside as well as on the outside surfaces of said sock sole, heal and toe regions.

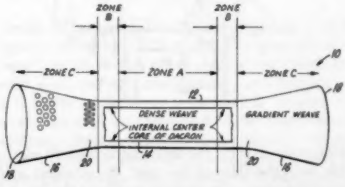
3. A method of manufacturing an improved sock, particularly intended for sports activities, comprising the steps of

knitting the body of said sock from a yarn of textile fibres that do not lend themselves to felting,

knitting into the inner and outer surfaces of the sole, heel, and toe regions of said sock a yarn consisting of textile fibres which can be felted, said feltable yarn forming loop pile meshes, and

fulling said sock so as to felt said feltable fibres of said yarn knitted into said sole, heel, and toe regions of said sock, whereby said regions of the sock are imparted a homogeneous, felt-like surface internally as well as externally.

4,255,820
ARTIFICIAL LIGAMENTS
Joel E. Rothermel, 55 Central Park West, New York, N.Y. 10023, and Robert J. Pawluk, 8 Valemont Rd., Montvale, N.J. 07645
Filed Jul. 24, 1979, Ser. No. 60,221
Int. Cl.³ A61F *1/00*
U.S. Cl. 3—1 **15 Claims**



1. A ligament prosthesis comprising:

a central tubular portion of fabric, said central portion being elongatable along its longitudinal axis; and

tubular end portions joined to each end of said central portion, said end portions including pores graduated in size to form a small pore structure proximate to said central portion and a larger pore structure at the end distal to said central portion, thereby to permit controlled tissue ingrowth within said end portions.

4,255,821

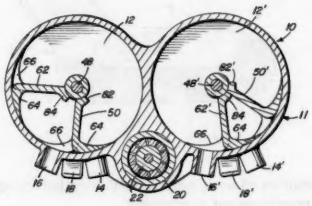
ARTIFICIAL HEART PUMP

Mark P. Carol, 1902 Park Ave., Baltimore, Md. 21217, and David J. Carol, 63 Scenic Dr., Leominster, Mass. 01453

Filed Apr. 2, 1979, Ser. No. 26,552

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1.7 **18 Claims**



1. An artificial heart pump for use in replacing the natural heart organ comprising: a first pumping mechanism including a first cylindrical pump chamber and including a first pair of independently rotatable radially extending pump vanes mounted in said first pump chamber; a first inlet means and a first outlet means for connecting said first pump chamber to a systemic circulatory system; a second pumping mechanism including a second cylindrical pump chamber, a second pair of radially extending rotatable vanes mounted in said second pump chamber, a second input means and a second output means for connecting said second pump chamber to a pulmonary circulatory system; drive means connected to said first pair of radially extending vanes and said second pair of radially extending vanes for causing independent rotation of said first pair of radially extending vanes and said second pair of radially extending vanes; and control means for controlling the operation of said drive means for equalizing the input and output of each of said pumping mechanisms.

4,255,822

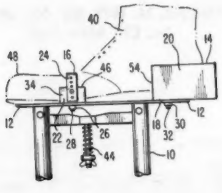
SHOE HOLDER ADAPTERS FOR STIFF PLATFORM

William Dixon, Rte. #2, Box 2009, Browns Mills, N.J. 08015

Filed Oct. 30, 1978, Ser. No. 956,128

Int. Cl.³ A61F *3/00*; A63B *25/06*

U.S. Cl. 3—4 **7 Claims**



1. Adapters for mating the shoe receiving stilt platform of a utility stilt with the shoe of the user, the adapters including a frontal member adapted to receive and hold the frontal area of a user's shoe therein and a heel member adapted to receive and holu the heel area of the user's shoe therein when the frontal area of the user's shoe is placed within the frontal member, the frontal member including a frontal base having means extending from one lateral end of the frontal base to the other lateral end thereof and disposed in spaced relation above said base member to define a frontal shoe receiving opening into which the user will place the frontal area of the shoe, and a heel member including a heel base and at least two lateral heel plates extending upwardly from the lateral edges of said heel base and being angled with respect to one another in the vertical direction with the front ends thereof spaced from one another a greater distance than the rear ends and adapted to receive and hold the heel area of the user's shoe therein; the frontal member having means for adjustably mounting said frontal member longitudinally of a stilt platform and said heel member having means for adjustably mounting said heel member longitudinally of said stilt platform wherein the spacing between said frontal member and said heel member may be adjusted, whereby on such adjustment together with the means extending in spaced relation above and between said one end of said frontal base to the other said end, said adapters may be fixedly adjusted onto a shoe receiving platform whereby any size shoe to which said adapters have been properly adjusted can be stepped into said adapters and held to the stilt platform and released therefrom only on sufficient upward and rearward pressure being exerted to said shoe to free it from said adjusted adapters.

4,255,823

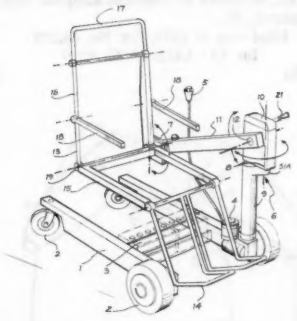
APPARATUS FOR MOVING AND/OR TRANSPORTING LOADS

Adrian J. Boyer, "Oakbank", Minore Rd., Via Dubbo, New South Wales 2830; William R. Richardson, 19 Allison St., Dubbo, New South Wales 2830; Robert J. Metcalfe, 107 Kissing Point Rd., Turramurra, New South Wales 2073, and Peter J. Foden, East Brighton, all of Australia, assignors to Adrion J. Boyer, Via Dubbo; William R. Richardson, Dubbo and Robert J. Metcalfe, Turramurra, all of, Australia

Filed Mar. 21, 1979, Ser. No. 22,440

Int. Cl.³ A47B *83/04*; A61G *1/02*

U.S. Cl. 5—81 R **24 Claims**



1. For use with a patient support structure, a patient transporter comprising a base frame, wheels or the like fitted to the base frame to support it for movement in at least fore-and-aft directions, and holding means mounted on the base frame to hold the patient support structure above the base frame, wherein the holding means is mounted on one side of the base frame relative to the fore-and-aft directions, and includes lifting means operable in use of the transporter to raise and lower the patient support structure relative to the base frame and pivot means operable in use to enable horizontal rotation of the patient support structure between positions in which it is aligned with and transverse to the said fore-and-aft directions, said lifting means comprising an arm pivotally mounted for

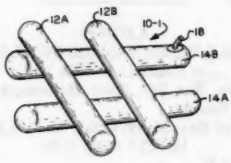
swinging movement about a generally horizontal arm pivot axis whereby its end remote from the pivot axis can be raised and lowered by said swinging movement and said pivot means comprises a hinge type joint to mount the patient support structure on said remote end of the arm and defining an upright hinge axis about which said horizontal rotation of the patient support structure is executed.

4,255,824

CUSHION FOR DECUBITUS ULCERS

Samuel Pertchik, 225 E. Beech St., Long Beach, N.Y. 11561

Filed Jun. 7, 1979, Ser. No. 46,476
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—441 **5 Claims**



1. A Decubitus Ulcer cushion for alleviation or prevention of the formation of decubitus ulcers in immobile patients comprising:

first and second inflatable substantially cylindrical support cylinders defining a first plane and being disposed in spaced apart relation with respect to each other with at least one pair of corresponding end portions separated to form an open-ended cushion; and

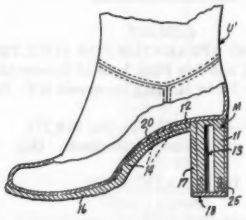
interconnecting means defining a second plane and securing said support cylinders to each other to restrain separation between said first and second support cylinders beyond a predetermined maximum extent.

4,255,825

BOOTS OF INJECTION MOLDED PLASTIC AND PROCESS THEREFOR

Pietro L. Rigon, Vicenza, Italy, assignor to Rigon, S.P.A., Vicenza, Italy

Division of Ser. No. 895,019, Apr. 10, 1978. This application Jun. 6, 1979, Ser. No. 46,016
Int. Cl.³ A43D *9/00*; A43B *1/10, 13/28*
U.S. Cl. 12—142 RS **15 Claims**



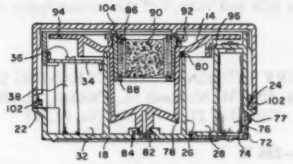
1. A process for producing boots made of plastic material and having a reinforcing arch, with an instep portion and a heel body, incorporated in the fusion of the sole and heel, characterized in that the process comprises an initial phase in which the upper body of the boot and the complete insole are formed by injection-molding, and a second phase in which the instep portion is disposed against the insole and the sole and heel covering are formed by injection-molding with the instep portion and the body of the heel of the reinforcing arch being firmly anchored to the insole produced in the initial molding phase by means of passages through said instep portion, and in the sides of the body of the heel.

4,255,826

NAIL POLISH REMOVER

Raymond Boyd, 2235 Cambridge Rd., Broomall, Pa. 19008

Filed May 2, 1979, Ser. No. 35,228
Int. Cl.³ A45D *29/17*; A46B *13/04*
U.S. Cl. 15—21 R **5 Claims**



1. A nail polish remover comprising:

a support means;

a substantially cylindrically shaped cup means supported by said support means so as to be rotatable about a substantially vertical axis, said cup means having impervious cylindrical side walls and being adapted to contain a quantity of a solvent solution therein;

a substantially cylindrically shaped brush means carried by said cup means for rotation therewith, said brush means being open at the center thereof whereby a finger may be inserted therein and the nail pressed against the same;

motor means carried by said support means for rotating said cup means and said brush means about said vertical axis, and

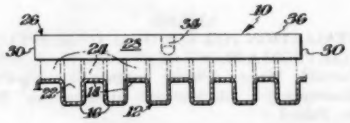
a cover means for covering at least a part of said support means, said cover means including means engaging the upper portion of said cup means for sealing said cup means closed when said cover means is in place.

4,255,827

REEFER SWEEPER

Salvator F. Palazzo, 154 Hickory Hill Rd., Philadelphia, Pa. 19154

Filed Aug. 17, 1979, Ser. No. 67,620
Int. Cl.³ A46B *7/04*
U.S. Cl. 15—160 **10 Claims**



1. A reefer sweeper or the like for cleaning a multi-level surface having alternating hills and valleys comprising a plurality of major brush units, a plurality of minor brush units, said major brush units and said minor brush units being alternately arranged whereby each major brush unit is located next to a minor brush unit in a side-by-side fashion, each major brush unit comprising a base member having a plurality of relatively stiff bristles extending downwardly therefrom and its sides being substantially longer than its front face, each minor brush unit comprising a base member having a plurality of relatively stiff bristles extending downwardly therefrom and its sides

being substantially longer than its front face, fastening means securing said major brush units and said minor brush units together in said side-by-side fashion to form a composite assembly, said composite assembly having a front face formed by said front faces of said units and having a length corresponding to the length of said sides of said units, said composite assembly front face being substantially longer than said sides of said units, a handle secured to said composite assembly for moving said composite assembly in a direction perpendicular to its said front face, and the length of said major brush units bristles being longer than the length of said minor brush units whereby said bristle lengths may be selected to conform to the configuration of the hills and valleys of the surface being cleaned.

4,255,828

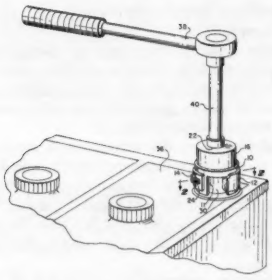
BATTERY TERMINAL POST CLEANING TOOL

Dan P. Colla, 5043 W. Montana St., Chicago, Ill. 60639

Filed Jul. 27, 1979, Ser. No. 61,367

Int. Cl.³ H01R *43/00*

U.S. Cl. 15—236 R **6 Claims**



1. A tool for cleaning the terminal posts of a battery comprising, a cylindrical socket with a machined inside surface forming a well of diameter suitable to engage over the largest of the posts on said battery, the socket having a cut-out window provided in the circumferential wall thereof, a spring metal clip adjustably secured for selective sliding movement about the outer surface of the wall of the socket, the clip being of generally arcuate configuration and having a free end extending through the window and into the well of the socket, said free end forming a scraping edge for engaging the circumferential surface of a selected battery post when the tool is installed thereon and rotated with respect thereto to scrape and clean said post, the window being sufficiently wide to permit such sliding movement for scraping of different post sizes.

4,255,829

INSTALLATION FOR REMOVAL OF SURPLUS MATERIAL FROM A BLOCK OF CELLULAR CONCRETE

Stefan Tarasiuk, Warsaw, Poland, assignor to Biuro Projektowo-Konstrukcyjne Mechanizacji Budownictwa Zremb, Warsaw, Poland

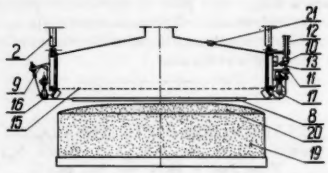
Filed Jun. 21, 1979, Ser. No. 50,943

Claims priority, application Poland, Jun. 26, 1978, 207930

Int. Cl.³ A47L *5/38*

U.S. Cl. 15—303 **6 Claims**

1. An installation for the removal of surplus material, from a block of cellular concrete or the like with the use of suction comprising, in combination, a suction nozzle, a lever mechanism for lowering said suction nozzle, means for driving said lever mechanism, said suction nozzle having a bowl-shaped configuration, at least one fan arranged to cooperate with said suction nozzle, said suction nozzle including a frame having a net stretched thereon, a tension-member sensor comprising a tension member arranged on said suction nozzle under said net in the plane of the transverse axis of said suction nozzle, a limit switch on said suction nozzle, a cam arranged to cooperate with said limit switch connected to one of the ends of said tension member, said limit switch being arranged to switch off



said suction nozzle lowering mechanism, and to simultaneous switch on said fans.

4,255,830

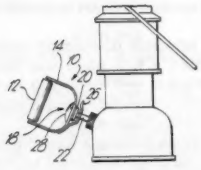
DETACHABLE PUMP HANDLE FOR LIQUID FUEL APPLIANCES

G. Kevin Wilson, Box 147, Sheet Harbour, Halifax County, Nova Scotia, Canada

Filed Dec. 26, 1979, Ser. No. 106,388

Int. Cl.³ B25G *1/00*

U.S. Cl. 16—114 R **2 Claims**



1. A detachable pump handle for liquid fuel appliances having a pumping stem and head thereon, said handle comprising a bracket to fit the hand of a person; a shank extending from the bracket and a seat for engaging the stem and head of the pump, said seat comprising a bracket extending from the handle shank for engaging the underside of the head and about the stem to draw the same upwardly from the appliance, and a resilient sealing pad on the handle shank in juxtaposition to the bracket for engaging the head of the stem and for closing off the air passage therein when the handle is used to push the stem and head inwardly of the appliance.

4,255,831

MODELLING APPARATUS FOR POULTRY

Mannes Van Ginkel, and Jan Plug, both of Barneveld, Netherlands, assignors to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Nov. 28, 1978, Ser. No. 964,271

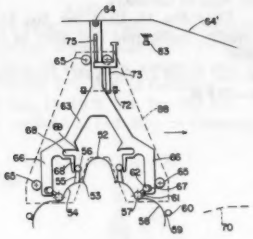
Claims priority, application Netherlands, Dec. 9, 1977, 7713638

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 **8 Claims**

1. A device for modelling poultry, comprising a modelling tube having a first shell member having end edges and a pair of further shell members having first ends pivotably connected with the said end edges of the first shell member, driving means for pivoting the further shell members from a first position, in which the first and further shell members form an open shell towards the second position in which they form a tube, and enclosure means which are movable from a first position, in which they leave free the open side of the shell members forming the open shell into a second position, in which they form a closed shell, said enclosure means comprising flaps which pivot about shafts which are located near second end

edges of the further shell members farthest from the first shell member when the further shell members are in their first position, driving means for moving the flaps from a spreadout



position in which their free end edges are spaced from each other towards a second position in which these end edges are near to each other.

4,255,832

DEVICE FOR HANDLING OBJECTS

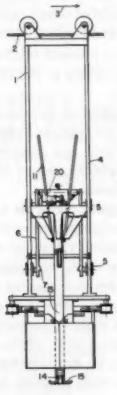
Mannes van Ginkel, and Jan Plug, both of Barneveld, Netherlands, assignors to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Nov. 28, 1978, Ser. No. 964,349

Claims priority, application Netherlands, Dec. 9, 1977, 7713640

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 **9 Claims**



1. A device for handling objects comprising an attaching means for receiving the object, a feeler located in the region of the attaching means and being movable between a first position wherein normal operation of the device is prevented and a second position wherein normal operation of the device is permitted, said feeler being positioned to be in said second position and impeded from movemet to the first position by the presence of an object in the attaching means.

4,255,833

WRAPPER CLOSED WITH A U-SHAPED CLIP AND PROCESS AND APPARATUS FOR ATTACHING A HANGER LOOP TO THE WRAPPER SECTION

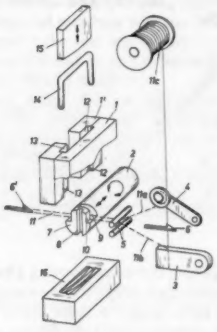
Herbert Niedecker, am Ellerhang 6, 6240 Konigstein 2, Fed. Rep. of Germany

Division of Ser. No. 866,969, Jan. 4, 1978, Pat. No. 4,165,593. This application Feb. 21, 1979, Ser. No. 13,649

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700641

Int. Cl.³ A22C *15/00*

U.S. Cl. 17—44.4 **2 Claims**



1. In combination, a wrapper having a mouth, a U-shaped clip closing the mouth of said wrapper, and a hanger loop having two non-knotted ends, the loop serving to hang up the filled wrapper, the hanger loop extending in at least one convolution around the closed clip and being secured to said wrapper by said clip.

4,255,834

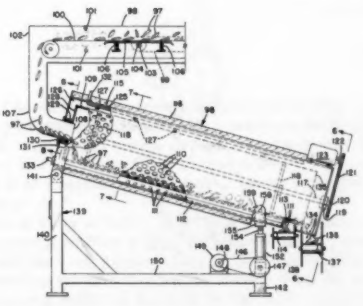
METHOD FOR SHUCKING SCALLOPS

William R. Lambert, 750 Scallop Dr., Port Canaveral, Fla. 32920

Filed May 17, 1979, Ser. No. 39,767

Int. Cl.³ A22C *29/04*

U.S. Cl. 17—48 **9 Claims**



1. A process for removing scallop meat from a scallop comprising the steps of; conveying a scallop with meat therein along a directed path of travel through a treatment zone and subjecting the scallops to an elevated temperature in said zone, while so conveying and exposing a substantial surface area of the scallop to the elevated temperature while the scallop is in motion to cause the scallop to open and release the meat from the shell, and continuously removing the meat from said zone

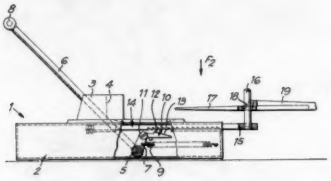
in one direction as separation occurs while continuing to convey said shells from said zone in a second direction.

4,255,835

DEVICE FOR OPENING SHELL-FISH

Andre E. V. Demulder, Herne, Belgium, assignor to Crombach Investment Company S.A., Luxembourg

Filed Aug. 24, 1979, Ser. No. 69,284
Int. Cl.[3] A22C *29/04*
U.S. Cl. 17—76 3 Claims



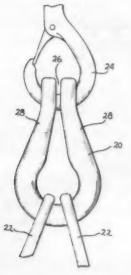
1. A shell opening device comprising a base having a planar upper face, an abutment projecting upwardly from said face, a shell opening knife having a blade and a handle, said knife having a hole therethrough substantially at the junction of blade and handle, a cylindrical post functionally integral with a supporting means extending through said hole and being slidably mounted in said base, the axis of said post being perpendicular to the plane of said upper face, the diameter of said post being substantially smaller that the diameter of said hole.

4,255,836

CONTINUOUS FILAMENT APEX FITTINGS AND METHODS OF MANUFACTURE THEREOF

Edmond A. Dunahoo, Long Beach, Calif., assignor to Fiber Science, Inc., Salt Lake City, Utah

Filed Oct. 23, 1978, Ser. No. 953,863
Int. Cl.[3] F16G *11/00*
U.S. Cl. 24—122.6 7 Claims



1. An apex fitting comprising an approximately U-shaped structure, the legs of the U-shaped structure each having a loop extending to the end thereof adjacent the loop on the other said leg, the U-shaped structure being comprised of a plurality of turns of continuous multifilament strands, the apex fitting being impregnated with a flexible binder to provide a self supporting structure having elasticity between said legs of said U-shaped structure.

4,255,837

MAGNETIC CLIP DEVICE

Herman Holtz, Wiesbaden-Nordenstadt, Fed. Rep. of Germany, assignor to Magnetoplan H. Jo. Holtz, Wiesbaden-Nordenstadt, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,381
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832998
Int. Cl.[3] A44B *21/00;* A45C *1/06;* G09F *3/00*
U.S. Cl. 24—243 R 18 Claims

1. In a magnetic clipping device for magnetically retaining sheet-like articles of the type including two permanent magnet face-like elements which are coupled directly together by a hinge and between which a sheet-like article is retained, the improvement comprising:

said permanent magnet elements each comprising a relatively thin permanent magnetic foil having a thickness up to about 1 mm in which is embedded an anisotropic powder-like magnet material, each of said foils being magnetized in a direction perpendicular to the faces thereof and in a manner so as to define relatively wide, stripe-like magnetic pole zones for generating magnetic adhering faces, said permanent magnet foils and said zones thereof being so dimensioned and disposed that zones of opposite polarity are disposed opposite one another, and wherein said permanent magnetic foils comprise a front foil constructed in a sandwich style layer consisting of a permanent magnetic foil, a further magnetic foil, and a ferromagnetic ground terminal foil mounted therebetween, and a rear permanent magnetic foil constructed in a sandwich style layer consisting of a permanent magnet foil, and a further magnet foil, and a ferromagnetic ground terminal foil mounted therebetween; and

said hinge being expansible to permit said foils to be maintained in a spaced parallel relationship to one another at a distance corresponding to the thickness of the article to be retained thereby.

15. In a magnetic clipping device for magnetically retaining sheet-like articles of the type including two permanent magnet face-like elements which are coupled directly together by a hinge and between which a sheet-like article is retained, the improvement comprising:

said permanent magnet elements each being shaped as bank note clips for retaining bank notes therebetween and each comprising a relatively thin permanent magnetic foil having a thickness up to about 1 mm in which is embedded an anisotropic powder-like magnet material, each of said foils being magnetized in a direction perpendicular to the faces thereof and in a manner so as to define relatively wide, stripe-like magnetic pole zones for generating magnetic adhering faces, said permanent magnet foils and said zones thereof being so dimensioned and disposed that zones of opposite polarity are disposed opposite one another, said permanent magnetic foils being each mounted onto a solid plate and wherein said solid plates are coupled with each other along one edge by an expansible plate hinge comprising a longitudinally-extending eyelet mounted on one of said plates through which a pin extends, which pin is rigidly coupled with the other of said plates, said hinge being expansible in such a manner that said plates are spaced in a parallel relationship with respect to each other

at a distance corresponding to the thickness of the article to be retained therein.

4,255,838

SUPPORT FOR ELECTRICAL BUSBARS

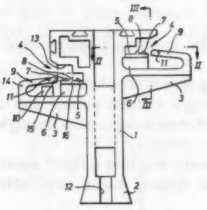
Rudiger Obst; Manfred Wilmes, and Peter E. Murray, all of Detmold, Fed. Rep. of Germany, assignors to C. A. Weidmuller K.G., Detmold, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,146

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816562

Int. Cl.[3] A44B *21/00*

U.S. Cl. 24—255 BS **8 Claims**



1. A support for an electrical busbar, comprising a body with a recess for receiving a busbar by movement of the latter transverse to its length, said body comprising a plate having side regions, said recess being defined between first and second opposed surfaces the first one of which is a surface of said plate, a respective projection being provided at each side of said plate, said projections projecting towards said second opposed surface, a rib being provided for supporting the central region of said plate between said projections, whereby the respective side regions of said plate are independently resiliently deflectable, thereby permitting independent resilient displacement of said projections away from said second opposed surface by a busbar inserted into said recess, thereby to reclamp the busbar against said second opposed surface, said support further comprising a resilient detent member disposed adjacent to the mouth of said recess for permitting insertion of a busbar into said recess and retaining the inserted busbar in said recess.

4,255,839

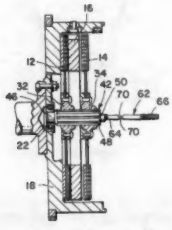
AUTOMOTIVE CLUTCH ALIGNMENT TOOL

Daniel Shea, 55 Pleasant Ave., Walden, N.Y. 12586

Filed Sep. 26, 1979, Ser. No. 79,221

Int. Cl.[3] B25B *27/14*

U.S. Cl. 29—274 **12 Claims**



1. An alignment tool apparatus in the nature of a dummy drive shaft for coaxially aligning the parts of an automotive clutch, said parts including an internally splined clutch disc normally located between an automotive flywheel having a central pilot bearing and a pressure plate assembly having a central release bearing, said tool comprising:

a first elongated generally cylindrical member having a splined surface for engaging said clutch disc, said first cylindrical member having a neck at its front end for engaging said pilot bearing;

a second elongated generally cylindrical member for engaging said release bearing, said second cylindrical member having a front end adapted to be placed against the rear end of said first cylindrical member; and

means, controllable from the rear of said second cylindrical member, for selectively axially locking together said first and second cylindrical members with the front end of said first member against the rear end of said second member or unlocking said first and second cylindrical members to enable separation of said members;

said tool apparatus, when said first and second cylindrical members are axially locked together, having an overall length being substantially the sum of the lengths of said first and second members;

whereby said first and second cylindrical members may be selectively assembled together or disassembled from each other while said first cylindrical member is located within said automotive clutch.

4,255,840

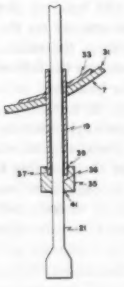
METHOD OF REPAIRING A HEATING ELEMENT IN A PRESSURIZER

Emil P. Loch, Tampa, and Frank J. Mendolia, Valrico, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1975, Ser. No. 624,349

Int. Cl.[2] B23P *7/00*

U.S. Cl. 29—157 R **1 Claim**



1. The method of replacing immersion heating elements having a metallic sheath welded to a thickened end of a tubular nozzle wherein said heating element is concentrically disposed within said nozzle and said nozzle is attached to the head portion of a pressurizer of a nuclear power plant comprising the steps of:

cutting away at least a portion of a weld disposed at the external juncture of the nozzle and the heating element so that the heating element may be removed from the nozzle;

removing the defective heating element from the nozzle;

removing sufficient metal from the outer surface of the nozzle to remove all metal degradated by the previous weld at the juncture between the nozzle and the sheath;

inserting an operable heating element in the nozzles so that there is a space between the end of the nozzle and the end of the heating element, the space being sufficient to prevent the end of the heating element from being overheated from the heat buildup during the subsequent welding step,

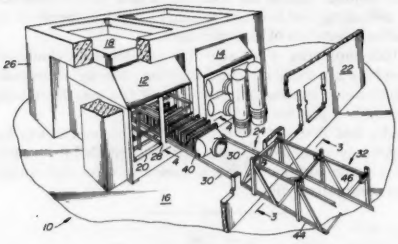
welding a bead on the outer surface of said thickened portion of the nozzle in such a manner that there is penetration of the sheath of the heating element to form a seal

therebetween and solely fix the heating element with respect to the nozzle.

4,255,841
CONDENSER CONSTRUCTION WITH DELAYED TUBE BUNDLES

Robert C. Boyer, Catasauqua, and George J. Williams, Chalfont, both of Pa., assignors to Ecolaire Incorporated, Malvern, Pa.

Filed Aug. 20, 1979, Ser. No. 68,022
Int. Cl.³ B23P *15/26*; B01J *8/06*; B21D *53/06*
U.S. Cl. 29—157.4 **6 Claims**

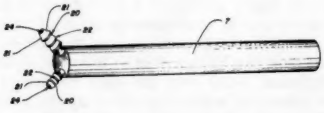


1. A method of manufacturing and assembling a steam condenser forming a part of a power plant comprising constructing a condenser outer shell with an internal track for supporting each tube bundle intended to be installed therein, installing the condenser shell at a building site, connecting said shell to interface equipment, temporarily closing at least one end of said shell, erecting additional portions of the building including at least one floor of said building above the elevation of said shell, providing an accessway on the same floor as the shell from outside the building, thereafter and shortly before it is desired to use the condenser the following steps are performed, constructing each tube bundle to be installed in the shell, then shipping each tube bundle to said site, moving each tube bundle through said accessway, removing any temporary closure on said one end of the shell, introducing each tube bundle along a track into said shell, sealing the shell, connecting hydraulic connections to each tube bundle, whereby the construction and installation of each tube bundle is delayed and occurs long subsequent to construction and installation of said shell.

4,255,842
TIRE STUD REMOVER

Robert L. McCaulou, Rte. 1, New Plymouth, Id. 83655

Filed Oct. 17, 1979, Ser. No. 85,887
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—235 **6 Claims**

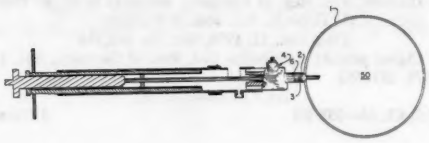


1. A tire stud remover comprising:
a handle; and
at least one tube portion outwardly extending from said handle, each of said tube portions defining a cylindrical orifice adapted to receive a tire stud and each of said tube portions having a substantially infundibulform portuberance adjacent the terminal free end of said tube portion.

4,255,843
THERMOWELD INSERTION DEVICE

L. J. Diez, 120 Park Dr., Gonzales, La. 70737

Continuation-in-part of Ser. No. 933,195, Aug. 14, 1978, abandoned. This application Jan. 8, 1979, Ser. No. 1,426
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—256 **1 Claim**

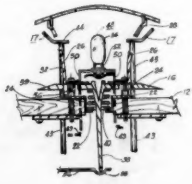


1. A device for inserting a thermoweld into a pipe cavity comprising:
(a) a coupling means attachable to said pipe, said coupling means having a sealable passageway of sufficient size to allow said thermoweld to pass through and be positioned in said pipe cavity;
(b) a thermoweld insertion support assembly comprising:
(i) an outer hollow casing attachable to said coupling means;
(ii) a valve seat retainer screwingly attached to the inner surface of said hollow casing at its end adjacent said coupling means, said valve seat retainer having a hollow passageway through which said thermoweld can be inserted and into which is positioned packing material held in place by a packing gland nut so as to form a seal about said thermoweld when it is inserted through the hollow passageway of said valve seat retainer;
(iii) a sealable opening is provided in said hollow casing at a position to the rear of said valve seat retainer, said opening being of sufficient size to allow the insertion of a wrench means operatingly attachable to said packing gland nut; and
(iv) an inner hollow casing adjustably positionable inside said outer casing;
and
(c) a thermoweld positioning rod insertable into said inner casing and extendable to said coupling means.

4,255,844
METHOD OF PREPARING POP BUMPERS OF A PIN BALL GAME FOR FIELD REPLACEMENT OF BALL WEARABLE PARTS

Edward S. Wentzell, Rte. 6, Box 111, Biloxi, Miss. 39632

Filed Mar. 22, 1979, Ser. No. 22,751
Int. Cl.³ B23P *7/00*; A63D *3/00*
U.S. Cl. 29—401.1 **2 Claims**



1. Method of preparing a pin ball game pop bumper for field replacement of ball wearable parts, said pop bumper having upper and lower combinations, the upper combination being fixed with holddown bolts through a playing table, and said combinations having respectively upper and lower electrical circuits that require breaking before replacement of said ball wearable parts, said method comprising the steps of:

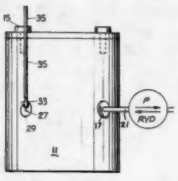
(a) removing soldered connections between upper and lower electrical circuits;
(b) bolt connecting terminals of lower electrical circuit to upper combination hold down bolts at their respective lower ends;
(c) screw and jam connecting with respective conductors the respective upper ends of said hold down bolts to the remainder of said upper electrical circuit; whereby backing off said hold down bolts disconnects said upper and lower circuits and releases said upper combination from said table for replacing ball wearable parts.

4,255,845

PROCESS FOR REPAIRING SMALL LEAKS IN METALLIC VESSELS

Harry J. Henderson, 1914 N. Tenth, Fargo, N. Dak. 58102

Filed Nov. 20, 1978, Ser. No. 962,245
Int. Cl.³ B23P 7/00
U.S. Cl. 29—402.02 **6 Claims**



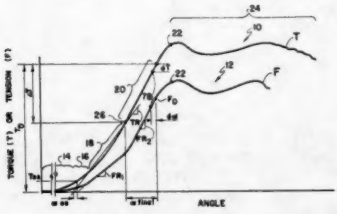
6. A method for repairing small leaks in a metal vessel intended to hold fluids under positive or negative gage pressure, comprising: (1) sealing the chamber of said vessel, (2) connecting said chamber to pneumatic means for varying the gas pressure therein, (3) applying a volumetrically-stable-setting cement externally to said small leaks, and (4) creating a low-pressure partial vacuum in said chamber during the application of said sealing cement whereby said cement is forced by atmospheric pressure into said leaks.

4,255,846

TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570, and Ser. No. 712,554, Aug. 9, 1976, abandoned. This application Apr. 19, 1979, Ser. No. 31,357
Int. Cl.³ B23P 19/06
U.S. Cl. 29—407 **9 Claims**



1. A method of tightening seriatim a multiplicity of substantially identical joints including at least one threaded fastener, comprising

applying torque to the fastener with a tool and tightening the joint;

conducting a quality control procedure in a time interval commencing with the onset of tightening of a fastener and terminating with the onset of tightening of the next successive fastener to determine if tightening is conducted properly, including generating a signal representative of a conclusion of the procedure; and

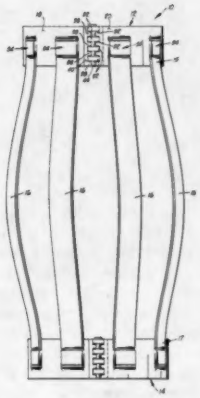
determining the frequency of the signal relative to the number of joints tightened.

4,255,847

METHOD OF MAKING A KNOCKDOWN CENTRALIZER

Thomas W. Howe, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 957,552, Nov. 3, 1978, Pat. No. 4,219,081. This application Aug. 16, 1979, Ser. No. 67,102
Int. Cl.³ B23P 9/00
U.S. Cl. 29—445 **4 Claims**



1. A method of manufacturing a centralizer of the type having an upper and a lower collar connected by a plurality of spring members, said collars including a plurality of arcuate collar portions with each collar portion being connected to at least two spring members by means of spring member receiving pockets which receive ends of the spring members, said method comprising the steps of:

forming said spring member receiving pockets in an upper and a lower flat collar portion;

assembling said upper and lower flat collar portions with at least two of said spring members; and

forming said flat collar portions into arcuate collar portions while said spring members are assembled therewith.

4,255,848

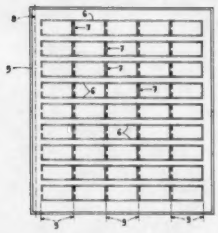
METHOD FOR THE MANUFACTURE OF A SET OF PASSIVE ELECTRO-OPTIC DISPLAY CELLS

William G. Freer, Saint-Blaise, and Jean-Luc Simon, Marin, both of Switzerland, assignors to Ebauches Electroniques S.A., Neuchatel, Switzerland

Filed Oct. 30, 1979, Ser. No. 89,509
Claims priority, application Switzerland, Nov. 6, 1978, 11387/78
Int. Cl.³ G02F 1/13
U.S. Cl. 29—592 R **10 Claims**

1. Method of manufacturing a set of passive electro-optic display cells having two superimposed plates maintained at a distance from each other by sealing material situated at their periphery and between which is imprisoned a liquid crystal, comprising: providing two plates having dimensions greater than each of the cells of the set, depositing on these plates in a matrix configuration juxtaposed groups of conductive layers constituting in each group the display elements and the conductive tracks of each cell, placing sealing material on at least

one of the plates to form a closed belt surrounding all the groups of conductive layers deposited on the plates, and to form a set of open belts surrounding each group of conductive layers, superimposing the plates, producing the softening followed by the hardening of only the closed belt, thus providing between the two plates a closed space enclosing the whole of the open belts, submitting the plates to a pressure which is higher than the pressure under which the closing of the said closed space has been effected, while the plates remain submitted to this overpressure, producing the softening of the material constituting the open and closed belts, the material of the



open belts containing elements for spacing of the plates, said overpressure producing the bringing together of the two plates up to the distance provided for by the said spacing elements, and then producing the hardening of the material of the open belts at least, providing at least one opening in the closed belt, placing the two plates in a vessel under vacuum so as to eliminate the air contained between them, filling the space between the places with a liquid crystal, cutting the plates so as to separate, at least partially, one from each other the cells of the set, and closing the passages provided between the ends of the open belts.

4,255,849

METHOD FOR CONSTRUCTING A SUPERCONDUCTING MAGNET WINDING

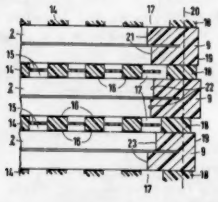
Kurt Beck, deceased, late of Erlangen, Fed. Rep. of Germany; by Christa Beck, heir, Erlangen, Fed. Rep. of Germany; by Thomas Beck, heir, Erlangen, Fed. Rep. of Germany; by Matthias Beck, heir, Erlangen, Fed. Rep. of Germany, and Helmut Marsing, Neunkirchen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 960,821

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1977, 2753055

Int. Cl.³ H01L *39/24;* H01F *41/04*

U.S. Cl. 29—599 **11 Claims**



1. A method for constructing a superconducting magnet winding which contains several winding layers which are arranged parallel to each other with a separator of insulating material forming cooling ducts inserted between each two layers, and which winding is surrounded, at least at parts of its outer surface, by hardenable material which is worked down to a predetermined dimension after the hardening process, comprising:

(a) individually prefabricating each winding layer with an outer surface having a ridge shaped cast extension of the hardenable material;

(b) assembling said winding layers with spacers therebetween into a magnet winding; and

(c) working the cast extensions of all winding layers down to the predetermined dimension after the entire winding is assembled.

4,255,850

WIRE FEED AND CONTACT INSERTION APPARATUS

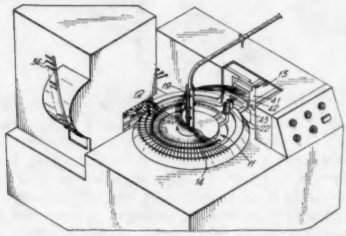
Kunitada Tominoi, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 871,666, Jan. 23, 1978, Pat. No. 4,171,566. This application May 14, 1979, Ser. No. 39,056

Claims priority, application Japan, Jan. 25, 1977, 52-2866

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—742 **4 Claims**



1. Apparatus for feeding individual wires of a series of wires successively to spaced apart operating stations comprising a wire locating jig including an annulus or disc having a series of circumferentially closely spaced slots on one side for locating individual wires, the jig being mounted for stepped rotation past a first operating station, a wire transfer mechanism comprising a plurality of widely circumferentially spaced wire gripping jaws mounted for stepped rotation in the same direction as the jig past the first and a second operating station, the jaws being movable axially of the jig from the other side of the jig to grip and remove a wire from a slot and transfer the wire from the first to the second operating station in synchronism with the jig movement.

4,255,851

METHOD AND APPARATUS FOR INDELIBLY MARKING ARTICLES DURING A MANUFACTURING PROCESS

Joseph J. Fortuna, Lehigh County, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 967,175

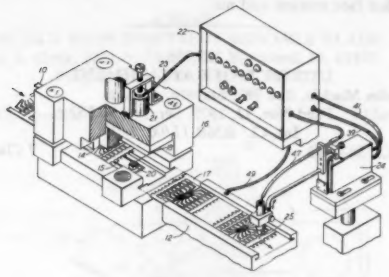
Int. Cl.³ H05K *3/30*

U.S. Cl. 29—827 **6 Claims**

1. A method of indicating a defective site in a lead frame assembly having a plurality of components bonded thereto comprising the steps of:

(a) positioning a portion of the lead frame assembly which will be discarded in a later manufacturing process and

which is in the region of the defective component into a spaced relationship with a charged spark electrode; and



(b) producing a spark between said electrode and the lead frame assembly for marking said portion of the lead frame.

4,255,852

METHOD OF CONSTRUCTING A NUMBER OF DIFFERENT MEMORY SYSTEMS

Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Division of Ser. No. 856,433, Dec. 1, 1977, Pat. No. 4,190,901. This application Jul. 16, 1979, Ser. No. 57,783

Int. Cl.[3] H05K *3/32*

U.S. Cl. 29—837 **8 Claims**

1. A method of constructing a number of different memory systems which can include a number of different features using a two layer circuit board having a number of sections for mounting a number of integrated circuit packages thereon, each package having a number of pins, said method comprising the steps of:

drilling holes on said circuit board, said step of drilling holes including:

drilling first sets of holes in each of said sections of said board including certain ones of said sections associated with all of said number of different features for connection to a corresponding number of groups of logic circuits included within predetermined ones of said number of integrated packages associated with all of said different features and which are to be mounted in said certain ones of said sections; and

drilling second sets of holes in said certain ones of said sections of said board, said second sets of holes being drilled parallel to and offset from a plurality of said first sets of holes in said certain ones of said sections so as to enable connection of said pins of an alternate group of logic circuits included within said predetermined ones of said number of integrated circuit packages to be mounted therein;

etching first and second layers of said two layer surfaces of said circuit board to form a number of horizontal and vertical conductor paths respectively for connection to said pins of each of said number of said integrated circuit packages mounted on said board for construction of said memory system including all of said different features; and,

mounting said predetermined ones of said integrated circuit packages into selected ones of said first and second sets of holes in said certain ones of said sections, said mounting step including mounting in the remaining first sets of holes of the other sections of said circuit board only those integrated circuit packages required to implement selected ones of said different features enabling subsequent connection of said number of pins of said packages to said horizontal and vertical conductor paths.

4,255,853

METHOD FOR INTERCONNECTING THE TERMINALS OF ELECTRICAL ASSEMBLIES

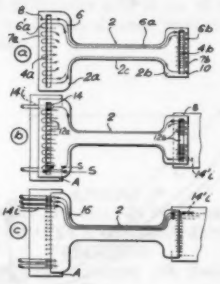
Louis Campillo, Domene, and Gerard Nicolas, Voreppe, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 20, 1979, Ser. No. 31,836

Claims priority, application France, Apr. 28, 1978, 78 12698

Int. Cl.[3] H01B *7/08;* **H01R** *11/06*

U.S. Cl. 29—843 **5 Claims**



1. A method for electrically connecting, by means of electrically conducting connections, two assemblies each having n connecting terminals, the connecting terminals of at least one of said assemblies being designed in the form of conducting zones located at the level of the external surface of the assembly support, wherein said method includes the sequential steps of:

providing at least one flexible insulating support having two connecting end-portions and a central portion, at least one slot being formed in at least one of said connecting end-portions, said slot being arranged to be superposed on the terminals of the corresponding assembly over said conducting zones, said flexible support being provided with at least one extension located beyond said slot with respect to said central portion;

bonding at least said slotted end-portion of the flexible support to the respective assembly;

providing n electrical connecting leads and bonding said leads to said flexible support including said extension, at least one end of each connecting lead being placed above said slot opposite to the terminal conducting zone to which said lead is intended to be electrically connected; and

establishing an electrical contact between each end of the connecting leads and their respective terminal conducting zone.

4,255,854

GRAPEFRUIT CUTTING KNIFE

Francisco Bilbao, 5775 SW. 8 St., Miami, Fla. 33144

Filed Aug. 20, 1979, Ser. No. 67,814

Int. Cl.[3] A21C *5/08*

U.S. Cl. 30—114 **1 Claim**

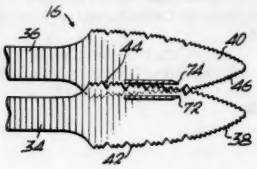
1. A grapefruit knife comprising:

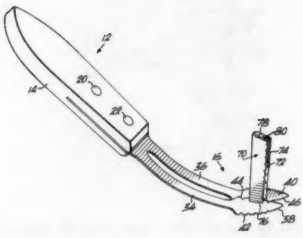
a handle, and

a working end comprising;

an arcuate bifurcated end defining first and second legs, each leg having rearwardly serrated edges and a pointed terminal end, each leg having an inner portion, one inner portion in overlaying relation to the other, and a cutting tower extending vertically a predetermined distance in a perpendicular direction from the overlaying inner portions comprising a U-shaped member having forwardly facing vertically extending serrated leading edges, one

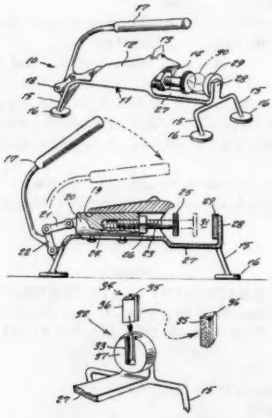
vertical leading edge being slightly higher than the other, and a bridge member joining the vertical leading edges,





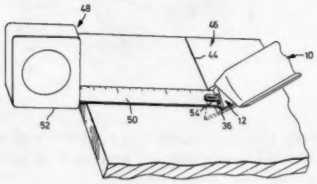
the bridge member being recessed and defining a seed removal means.

4,255,855
NUTCRACKER
John W. Brazil, c/o Ms. Margie Del Moro, 1918 Alhambra Blvd., Sacramento, Calif. 95816
Filed Nov. 29, 1979, Ser. No. 98,402
Int. Cl.[3] A47J *43/26*; B26B *17/00*
U.S. Cl. 30—120.5 **1 Claim**



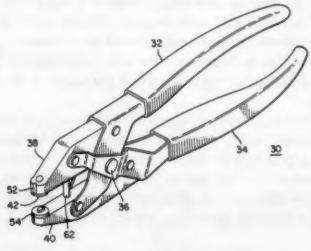
1. A nutcracker, comprising, in combination, a base having a hole through one end thereof, an anvil supported on an opposite end thereof, a space between said ends for placement of a nut therein, a plunger slidable in said holes a pivotable handle for sliding said plunger toward said anvil, and cracking a nut shell of said nut placed between said plunger and said anvil; an adjustable bolt on said plunger for controlling a length of said space, and a reversible bar slide-fitted in a slot on said anvil, one side of said bar being shaped with a projecting wedge, so as to split said nut shells therewith and an opposite side of said bar having a flat face that is knurlled, said reversible bar being selectively positioned with either said wedge or said flat, knurlled face toward said nut.

4,255,856
UTILITY KNIFE ATTACHMENT
Malcolm Mackie, Box 787, Stayner, Canada
Filed Nov. 13, 1979, Ser. No. 93,552
Int. Cl.[3] B26B *11/00, 1/08*
U.S. Cl. 30—293 **7 Claims**



1. An attachment for a utility knife of the type which includes a handle comprising first and second separable handle parts defining there between a slot at an end of the handle for receiving a replaceable blade of relatively thin plate form having an outer end portion formed with a cutting edge, means retaining the blade in said slot with said outer end portion protruding from the handle, and means removably coupling the handle parts together so as to permit replacement of the blade, the attachment comprising a first portion of relatively thin plate form adapted overlie at least a portion of the knife blade within said slot and projecting outwardly of said slot alongside the blade, and a second portion coupled to said first portion externally of the slot but inwardly of the outer end of the blade, said second portion projecting outwardly away from the blade and being formed with an opening adapted to receive an end fitment of a measuring tape so that the tape can be coupled to the knife and extend laterally therefrom generally normal to the blade.

4,255,857
SELECTIVE CONDUCTOR SEVERING TOOL
Robert G. Foley, Redondo Beach, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed Oct. 11, 1979, Ser. No. 83,814
Int. Cl.[3] B26F *1/00*
U.S. Cl. 30—363 **13 Claims**



1. A tool for selectively severing at least one conductor of a multi-conductor flat cable comprising: punch means having a first conductor relief slot; and die means having a main portion to accept said punch means therein and a second conductor relief slot therein whereby when said punch means and said die means are closed upon a selected conductor of a multi-conductor flat cable, a portion of such conductor is severed by said

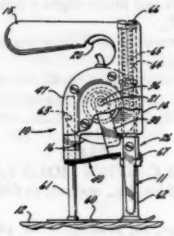
punch means and said die means and the free end of such conductor is captured between said first and said second conductor relief slots.

4,255,858

JIG SAW WITH ORBITALLY MOVABLE BLADE

Sidney A. Getts, 1923 N. Church St., Rockford, Ill. 61103

Filed Jun. 18, 1979, Ser. No. 49,427
Int. Cl.³ B27B *19/00*
U.S. Cl. 30—393 **9 Claims**



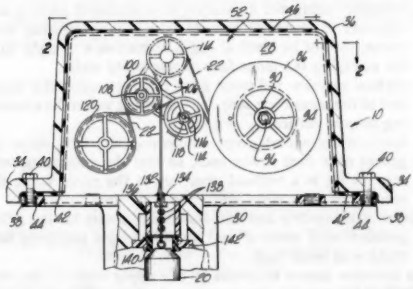
1. A saw having a support, a power driven shaft mounted on said support to rotate about a predetermined axis, a holder attached turnably to said shaft at a location disposed eccentrically of said axis, means for attaching an elongated saw blade to said holder, and a resiliently yieldable strap joined to said support and said holder to cause said holder to move in a substantially elliptical orbit during rotation of said shaft, said strap comprising a stack of leaf springs disposed in face-to-face relation, each of said springs having one end anchored to said support and having an opposite end joined to said holder.

4,255,859

DROP-WEIGHT MATERIAL LEVEL INDICATOR

Kenneth J. Klieman, St. Clair, Mich., assignor to Berwind Corporation, Philadelphia, Pa.

Filed May 7, 1979, Ser. No. 36,824
Int. Cl.³ G01F *23/04*
U.S. Cl. 33—126.6 **15 Claims**



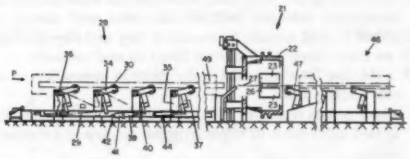
1. A drop weight material level indicator comprising support means including a support wall adapted to be mounted in vertical orientation above a material surface whose level is to be sensed, a spool mounted to said wall to rotate about a fixed spool axis, a drop line attached at one end to said spool and having a drop weight suspended from the other end, a motor rotationally coupled to said spool selectively for winding and unwinding said drop line on said spool, a lever arm disposed on said wall to pivot about a fixed lever axis parallel to said spool axis, spring means coupled to said lever arm and to said wall for biasing said lever arm pivotally away from said spool, a first idler pulley carried by said wall freely to rotate about said lever axis, a second idler pulley carried by an end of said lever arm remote from said lever axis and freely rotatable about an axis parallel to said lever axis, a third idler pulley carried by said wall to rotate about a fixed axis parallel to said spool axis, and level sensing means including means responsive to rotation of said third pulley for indicating material level, said drop line being trained from said spool over said second pulley so as to place in tension the portion of said drop line extending between said spool and said second pulley, said drop line being further trained in succession from said second pulley around said first pulley, around said third pulley, again around said first pulley and then to said drop weight, said drop line being in frictional contact with said third pulley over an arc of at least substantially 270° so as to minimize slippage between said drop line and said third pulley.

4,255,860

CALIBRATING APPARATUS FOR INSIDE AND OUTSIDE SURFACES AND ALIGNMENT OF PIPE SECTIONS

Christian Ragettli, Altstetterstrasse 149, Zurich, Switzerland (8048)

Filed Apr. 17, 1979, Ser. No. 30,752
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1978, 2816722
Int. Cl.³ G01B *7/12*
U.S. Cl. 33—143 L **14 Claims**



1. Calibrating apparatus for inside and outside calibration of pipe sections and for alignment of a calibrated pipe section with a calibrated preceding pipe section comprising:

a feed mechanism including feed rolls for moving successive pipe sections onto a tilting table and into a calibrating unit for measurement and alignment;

a tilting table for supporting the pipe section being calibrated;

said feed rolls being horizontally movable on said tilting table;

calibrating jaw means including opposing jaws to encircle the pipe section on said tilting table;

adjustable mounting means for said feed rolls and calibrating jaw means comprising a swivelable mount for said feed rolls, hydraulically actuatable cylinder and piston means abutting said feed rolls and sensor means coacting with the pipe section passing through said feed rolls to adjust the pressure of said rolls in response to the closing movement of the calibrating jaws to block any movement thereof;

braking means responsive to said sensor means for stopping the tilting movement of said tilting table, said braking means including a secondary connection means to the calibrating jaws which are adapted to stop the closing movement of said jaws when the tilting table movement is blocked; and

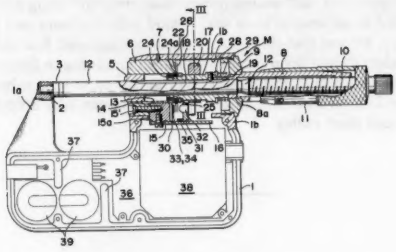
a discharge means in alignment with said calibrating jaw means and said feed rolls which discharges calibrated pipe sections after alignment with a preceding pipe section.

4,255,861

ELECTRICALLY DIGITAL DISPLAY MICROMETER

Kiyohiro Nakata, and Hiroaki Suwa, both of Kure, Japan, assignors to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 53,729
Int. Cl.[3] G01B 3/18
U.S. Cl. 33—166 11 Claims



1. An electrical digital display micrometer comprising:

A. a U-shaped frame with a small-diameter hole bored in one arm thereof and a large-diameter through hole axially aligned with said hole and bored in the other arm;

B. an anvil fitted in the small-diameter hole of said frame;

C. a ring retainer dismountably attached to one opening of said through hole in said U-shaped frame;

D. a sleeve dismountably attached to the other opening of said through hole in said U-shaped frame;

E. a spindle supported by said retainer and said sleeve for movement toward and away from, said anvil;

F. a tubular piece externally mounted on said spindle and interposed between said retainer and said sleeve and linked to said spindle by means of key and key groove;

G. an index scale of disc form fitted to said retainer;

H. a slit disc fitted to said tubular piece in opposition to said index scale; and

I. sensor means responsive to rotation of said slit disc relative to said index scale to effect a digital display of a measured value;

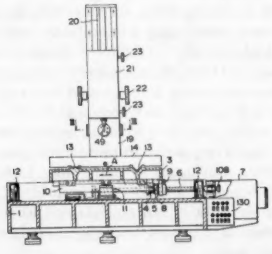
and wherein a spacer is inserted between the index scale and the slit disc and the tubular piece is urged by a spring toward the retainer.

4,255,862

CONFIGURED CONTOUR MEASURING APPARATUS

Tetsuo Nakamura, Kawasaki, Japan, assignor to Mitutoyo Manufacturing Company Inc., Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,272
Claims priority, application Japan, Oct. 26, 1978, 53-132272
Int. Cl.[3] G01B 7/28
U.S. Cl. 33—174 L 8 Claims



1. A configured contour measuring apparatus comprising:

a table **3** movably provided on a bed **1**;

a driving mechanism **7** for moving said table;

first detecting mechanisms **10, 11** for detecting a movement value of said table relative to the bed as a digital value;

a mount base **14** provided on said table and made movable in a direction perpendicular to movement of said table;

a detecting head **21** secured to a column **19** erected on said bed;

a sliding shaft **36** slidably provided on said detecting head and having a stylus **49** at the lower end thereof in opposed relationship with said mount base;

a balancer weight **54** connected through a hanging line **51** to said sliding shaft and made slightly lighter in weight than said sliding shaft;

pulleys **52, 53** for supporting the intermediate portion of said hanging line; and

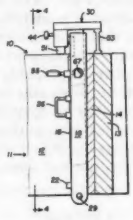
second detecting mechanisms **43, 44, 45** and **48** for detecting a movement value of said sliding shaft as a digital value.

4,255,863

CONTINUOUS CASTING MOLD TAPER GAGE

Louis Lazzaretti, Badden, Pa., assignor to Gladwin Corporation, Taylor, Mich.

Filed Apr. 14, 1980, Ser. No. 140,177
Int. Cl.[3] G01B 3/56
U.S. Cl. 33—174 E 10 Claims



1. A continuous casting mold wall taper gage for determining the angle, relative to vertical, of the interior casting face of a mold wall, comprising:

a vertically elongated, wall contact strip having one of its vertical edges formed as a straight edge for engaging the inner face of a mold wall;

a vertically elongated measuring strip arranged parallel and adjacent to the wall contact strip said measuring strip having one of its vertical edges formed as a straight edge for engaging the inner face of said mold wall;

a vertical position indicator gage mounted upon the upper end of the measuring strip for indicating when the measuring strip is vertically upright;

a horizontally axised pivot connecting the two strips together near their lower ends, so that the measuring strip may swing in a vertical plane about the pivot while the straight edge engages said mold wall inner face;

said measuring strip and said wall contact strip having a first position with each of said straight edges engaging said mold wall inner face;

an actuator means mounted at the upper ends of the two strips for moving the upper end of the measuring strip relative to the upper end of the wall contact strip so that the measuring strip swings about the pivot away from the mold wall inner face into vertical alignment relative to the mold contact strip;

a taper indicator mounted upon the strips between their upper and lower ends for measuring the distance of relative movement of the strips upon operation of said actuator means;

whereby said mold contact strip is arranged with a mold with its straight edge arranged in contact with the mold wall, and said actuator means is operated to move the measuring strip so that its straight edge swings away from

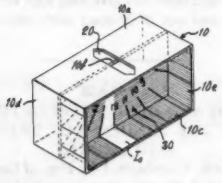
the mold wall until its vertical position indicator gage indicates that it is in vertical position, at which time, the taper indicator means is used to determine the taper angle of the straight edge and therefore the wall face, relative to the vertical.

4,255,864

SUN CLOCK

Scott R. Glendinning, c/o Glendinning Companies, Inc., 1 Glendinning Pl., Westport, Conn. 06880

Filed Jun. 15, 1978, Ser. No. 915,949
Int. Cl.³ G04B *49/00*
U.S. Cl. 33—270 **10 Claims**



1. A sun clock comprising:

flat means for displaying a proportionately expanded linear time index;

box-like means supporting said displaying means and having a slot in one face thereof for imaging sun's rays in the form of a line of light on said displaying means, said displaying means comprising a translucent face of said box-like means disposed opposite said slotted face;

means for supporting said box like means with its long axis perpendicular to the earth's "true" north south axis and with its slotted face tilted at the angle of latitude, whereby the light line falling on said displaying means indicates solar time on said time index; and

flat mirror means disposed adjacent and at an angle to said displaying means for reflecting an image of said time index and said light line thereon.

4,255,865

CAMBER ALIGNING TOOL

Gerald Levene, 125 Berkshire Pl., Irvington, N.J. 07111

Filed Oct. 9, 1979, Ser. No. 82,787
Int. Cl.³ G01B *5/255*
U.S. Cl. 33—336 **12 Claims**

1. A tool for checking the angle of camber of a vehicle wheel, comprising:

a frame, first means on said frame for engaging a first point on the rim of a vehicle wheel, said first engaging means including a plurality of upper pin members, means for attaching each of said upper pin members to said frame so that a first predetermined length of one of said upper pin members projects from said tool, second means on said frame spaced from said first means for engaging a second point on the rim of said vehicle wheel, the ends of said first and second engaging means determining a line which forms a predetermined angle with the vertical axis of said tool, said predetermined angle corresponding to the angle of camber of a properly-aligned wheel, and indicator

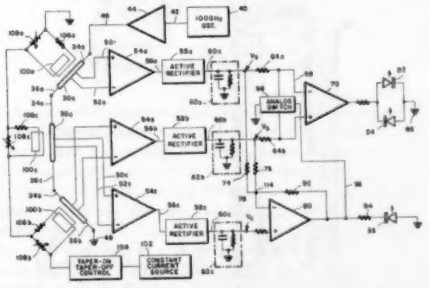
means disposed on said frame for providing an indication of whether the angle of camber of said wheel is proper.

4,255,866

NONMAGNETIC COMPASS

James T. Sears, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1979, Ser. No. 89,660
Int. Cl.³ G01C *17/30*
U.S. Cl. 33—361 **11 Claims**



1. A compass device for use in following a selected heading, said device comprising:

an array of first, second, and third Hall effect generators each having a principal axis of magnetic response and a side of predetermined polarity relative to the earth's magnetic field, said first and second generators having their principal axes normal to one another and at 45° to the principal axis of said third generator, and said first and second generators having sides of like predetermined polarity facing northerly directions when said third generator has its side of like polarity facing directly south;

means for energizing said first, second, and third generators with alternating current input voltages so as to provide first, second, and third alternating current output voltages corresponding in amplitude and phase relation to orientation of said array relative to the earth's magnetic field;

means for converting said first, second, and third alternating current voltages to first, second, and third direct current analog voltages wherein the magnitudes of the analog voltages are proportional to the cosines of the angles

between the respective principal axes of the generators and the earth's magnetic field, and the signs of the analog voltages are positive or negative as the respective generators have their sides of predetermined polarity facing northerly or southerly directions;

first, second, and third light emitting means corresponding respectively to a condition requiring turning left to attain said heading, and an on course condition;

first comparator means, responsive to said first and second analog voltages, for providing a first direct current output voltage that is of one sign when said first analog voltage is greater than said second analog voltage and is of opposite sign when said second analog voltage is greater than said first analog voltage;

said first light emitting means being lighted in response to said first direct current output voltage when of said first sign and said second light emitting means being lighted in response to said first direct current output voltage when of said opposite sign;

second comparator means, responsive to said first, second and third analog voltages to provide a second direct current output voltage that is of a first sign when the sum of said first and second analog voltages is greater than said third analog voltage and is of opposite sign when said sum is less than said third analog voltage; and

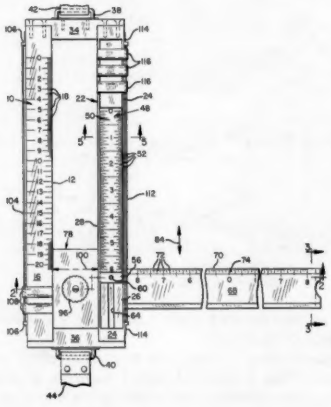
said third light emitting means being lighted in response to said second direct current output voltage when of said first sign.

4,255,867

GUIDELINE AND LAYOUT RULER FOR CALLIGRAPHERS

Ronald B. Taylor, 2828 N. Portland Blvd., Portland, Oreg. 97217

Filed Dec. 7, 1978, Ser. No. 967,264
Int. Cl.³ B43L *7/08*
U.S. Cl. 33—464 **2 Claims**



1. A layout ruler comprising:

an elongated first longitudinal member having an upwardly facing surface bearing a first set of graduation indicia spaced therealong;

elongated ruler insert means in parallel laterally spaced relation to said first longitudinal member, said ruler means having an upwardly facing surface bearing a second set of graduation indicia space therealong;

an elongated second longitudinal member defining a channel to slidably receive said ruler insert means, both said longitudinal members have inner sidewalls which face each other to define a central guideway therebetween, each of said walls defining a longitudinal groove;

a cross frame member which extends between said longitudinal members and retains said longitudinal members in spaced parallel relationship;

an elongated lateral straightedge member having a straight scribing edge;

attachment means slidably connecting one end of said straightedge member to said first longitudinal member for movement of said straightedge member in a direction parallel to the longitudinal axis of said first longitudinal member and for maintaining said straightedge at a fixed angle relative to said axis, said attachment means including a central member slidably retained in said guideway by opposed tongues which extend outwardly from said central member and are received by said grooves; and

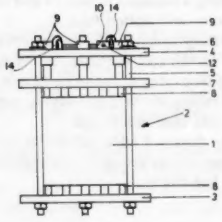
locking means for detachably retaining said central member in a fixed position relative to said longitudinal members, said locking means including means for securing said ruler against a flat supporting surface, a threaded shaft received by a vertical threaded opening through said central member, a foot at the end of said shaft nearest said supporting surface, and a control knob at the other end of said shaft for rotating said shaft to move said foot vertically between positions in and out of contact with said supporting surface.

4,255,868

METHOD AND DEVICE FOR OPTIMALLY STABILIZING THE WINDINGS OF TRANSFORMERS AND CHOKES

Siegfried Holzwarth, Viernheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,327
Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2820740
Int. Cl.³ F26B *7/00, 9/04*
U.S. Cl. 34—12 **19 Claims**



1. Method for optimally stabilizing the windings of transformers and chokes in a drying oven, which comprises pressing at least one winding in a drying oven at constant pressure during the entire drying process, and subjecting each winding to its required pressure if more than one winding is to be pressed simultaneously.

4,255,869

METHOD OF AND APPARATUS FOR THE OPERATION OF TREATMENT PROCESSES FOR BULK GOODS AND THE LIKE

Karl W. Quester, Pfarriusstr. 12; Johannes Haas, Gleueler Str. 151, both of 5000 Köln 41; Hans-Joachim Ulbrich, Schildgesstr. 40, 5040 Brühl, and Dieter Schröder, Märchenstr., 5000 Köln 80, all of Fed. Rep. of Germany

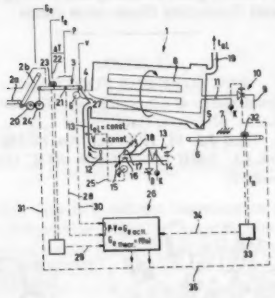
Filed Oct. 20, 1978, Ser. No. 953,315
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747232
Int. Cl.³ F26B *21/10, 21/12*
U.S. Cl. 34—25 **12 Claims**

2. An apparatus for treating bulk goods requiring control of

process parameters including moisture content, temperature and quantity of goods, said apparatus comprising:

(a) means for supplying a charge of bulk goods to be treated with respect to moisture content to a moisture treating zone,

(b) means for maintaining the process parameters constant within the moisture treating zone,



(c) means including a process computer for evaluating the rate of supply, moisture content of the goods to be treated, and the moisture content of the end product,

(d) said computer being effective to produce an evaluation of the weight of bulk goods in said charge according to the following formula:

$$G_e = \frac{Q}{[Y]}$$

$$[Y] = \left[\frac{100 - f_e}{100} \cdot C_T \cdot (t_a - t_e) + \frac{f_e}{100} \cdot C_w \cdot (t_a - t_e) + \frac{(100 - f_a) - (100 - f_e)}{100 - f_a} \cdot [C_w \cdot (100 - t_a) + 2260] \right]$$

wherein the symbols have the following meaning:

G_e	kg/h	weight of charge, i.e. initial weight
Q	KJ/h	heat output, or heat requirement
t_e	°C.	temperature on entry
t_a	°C.	temperature at exit
f_e	% H_2O	moisture-content of tobacco at entry
f_a	% H_2O	moisture-content of tobacco after cooling
T	min	time
p	kg	bearing load (belt balance)
v	m/sec	speed of belt (belt balance)
c_w	$\frac{KJ}{kg}$ K	specific heat capacity of water
c_T	$\frac{KJ}{kg}$ K	specific heat capacity of tobacco,

(e) means for controlling the rate of supply in response to any evaluation obtained by the process computer to maintain the remaining process parameters constant.

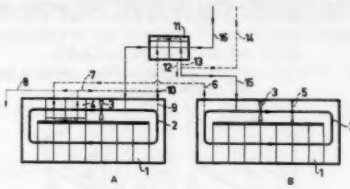
4,255,870

METHOD OF HOT-AIR DRYING

Lars Malmquist, Huddinge, Sweden, assignor to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Oct. 11, 1979, Ser. No. 83,655
Claims priority, application Sweden, Oct. 13, 1978, 7810712
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—35 **1 Claim**

1. A method of drying with hot air wherein drying takes place in two interconnected partial processes which are conditioned to substantially different wet temperature levels and each of which includes an air supply, circulation air and spent air, said method comprising: passing the spent air from the higher wet temperature partial process in heat exchange relationship with the circulation air of the lower wet temperature partial process; mixing the spent air from the two partial processes; passing the resulting mixed air in heat exchange relationship with the air supply to the lower wet temperature partial process to preheat said air supply; and passing part of the mixed air after said heat exchange to the higher wet temperature partial process as the air supply thereto.

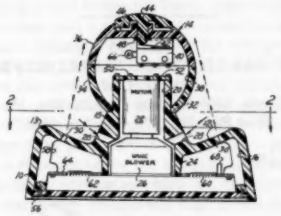


4,255,871

NAIL POLISH DRYER

John J. Sigman, 8579 Colony Dr., Algonac, Mich. 48001

Filed Mar. 28, 1979, Ser. No. 24,739
Int. Cl.³ F26B *19/00*
U.S. Cl. 34—243 R **6 Claims**



1. A nail polish dryer comprising an upwardly open generally bowl shaped body having an upwardly extending 360° periphery and a centrally located upward extension spaced inward from said periphery to define therewith an upwardly open annular channel having an inwardly and downwardly inclined annular bottom wall, said extension having at its top a generally spherically shaped hand support comprising substantially more than half of a complete sphere so that the lower portion thereof is curved downwardly and inwardly and is dimensioned to be manually engaged in such a way that the user's palm engages the top of said hand support and the fingers and thumb of the user extend downwardly toward the annular channel with the nails thereof generally in facing relation to said periphery, the bottom wall of said channel adjacent said periphery having a plurality of ports through which drying air is directed generally upwardly and radially inwardly against the nails of the user, and blower means for forcing drying air through said ports to said annular space.

4,255,872

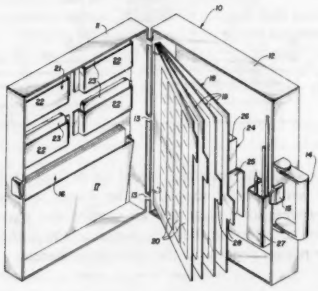
AUDIOVISUAL INTERVIEW PORTFOLIO

Eugene Williams, Sr., 5717 Farm Pond Lane, Columbia, Md. 21045

Filed Mar. 29, 1979, Ser. No. 25,045
Int. Cl.³ 281 *31;* G09B *1/02;* A45C *3/02;* B42D *1/06;* B65D *85/672*
U.S. Cl. 434—308 **2 Claims**

1. An interview portfolio for a teacher candidate comprising a rectangular case including two hingedly connected case

sections one of which is comparatively deeper than the other, plural comparatively small audiotape pockets within the less deep case section and occupying about one-half of the area thereof, a single large teacher notebook pocket within the last-named case section and occupying approximately the remaining half of the area thereof, a teacher videotape retaining pocket disposed within the deeper case section generally



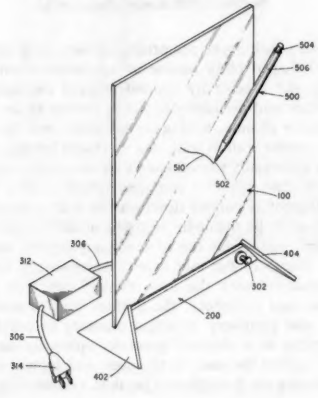
centrally, a pocket for accessories within the deeper case section near one side of the teacher videotape pocket, and a plurality of holder cards for projection slides hingedly held in the deeper case section in covering relationship to the videotape and accessory pockets and forming a divider means between the two case sections, said holder cards extending over the major portion of the area encompassed by the rectangular case sections.

4,255,873

OPTIC ART KIT NOVEL EXTRUDED FRAME MATERIAL

William J. Eberle, 2406 Wassner Dr., Reading, Pa. 19609

Filed Feb. 28, 1979, Ser. No. 16,107
Int. Cl.³ G09F *13/18*
U.S. Cl. 434—82 **15 Claims**



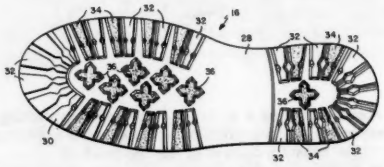
1. An optic art kit comprising:
(a) a light transmitting, abradable sheet material;
(b) fluorescent illumination means for transmitting light to the edge of said sheet, said fluorescent illumination means being cylindrical and having a remote ballast, and
(c) an extruded framing means having a base of sufficient length to mount said illuminating means thereon, a width slightly greater than the outside diameter of said illuminating means, sidewalls extending along the lengthwise edge of said base, said sidewalls having a length slightly greater than the radius of the illuminating means, arcs depending from said sidewalls and remote from said base, said arcs being concentric with respect to the longitudinal axis of said fluorescent illumination means and extending inwardly from the planes defined by said sidewalls, and vertically disposed flanges extending from the free ends of said arcs substantially parallel to said sidewalls, for substantially surrounding said fluorescent illumination means and for receiving and retaining said sheet in close proximity to said fluorescent illumination means.

4,255,874

LUG SOLE FOR FOOTWEAR

Giuseppe Sironi, Cerro di Laverno Mombello, Italy, assignor to Vibram S.p.A., Albizzate, Italy

Filed Jul. 18, 1979, Ser. No. 58,720
Int. Cl.³ A43B *13/04, 13/26;* A43C *15/00*
U.S. Cl. 36—32 R **8 Claims**



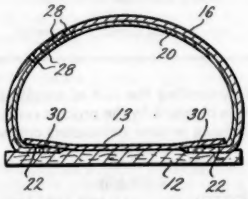
1. A sole comprising: a relatively hard sole body having a top surface adapted to be affixed to a mid-sole, said sole body also having a bottom surface, a plurality of downwardly extending, spaced apart first lugs integral with and located around a considerable portion of the periphery of said sole body bottom surface, said first lugs having the same hardness as said sole body, and a plurality of downwardly extending, a spaced-apart second lugs integral with and located around a considerable portion of the periphery of said sole body bottom surface, said second lugs disposed in a substantially alternating arrangement with said first lugs, said first and second lugs having the same height as measured from said bottom surface, with said second lugs being relatively soft in comparison to said first lugs.

4,255,875

SHOE WITH SUPPORTIVE GIRDLE LINER

Francis M. Gilkerson, P.O. Box 292, Mount Vernon, Mo. 65712

Filed Dec. 7, 1978, Ser. No. 967,133
Int. Cl.³ A43B *23/07*
U.S. Cl. 36—55 **10 Claims**



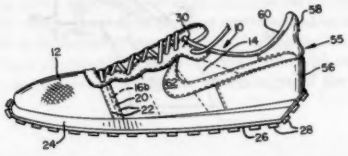
1. A shoe having an upper, means inside a portion of the upper and compatable with the material of the upper resisting stretching of the upper and retaining the shape and appearance of the upper, the means providing additional support for the foot of the wearer and retaining flexibility of the shoe, the shoe having means to prevent lining of the outer portion of the upper in the area of the compatable means, the compatable means extending around the metatarsal area of the shoe, the shoe further having means forming a sole and heel.

4,255,876

ATHLETIC SHOE HAVING AN UPPER TOE SECTION OF STRETCHABLE MATERIAL, EXTERNAL REINFORCING STRIPS AND IMPROVED LACING

Jeffrey O. Johnson, Newton, N.H., assignor to BRS, Inc., Beaverton, Oreg.

Filed May 31, 1979, Ser. No. 44,241
Int. Cl.[3] A43B *5/00, 5/06, 23/00, 11/00*
U.S. Cl. 36—83 14 Claims



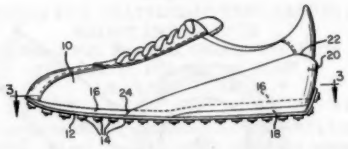
1. An athletic shoe in which the improvement comprises:
an upper shoe portion formed of a toe section and a main body section jointed together and joined in a sole portion;
said toe section extending generally forwardly of the metatarsal phalangeal joints of a foot positioned within the shoe and being formed of a stretchable material so as to facilitate flexing of the toes of the foot;
said main body section being of a nonstretchable material for at least partially immobilizing the portion of the foot rearwardly of the toes;
said upper portion defining a tongue opening and including a lacing portion which defines lace openings along the sides of the tongue opening;
said upper portion also including first and second reinforcing strips extending from said sole portion to said lacing portion, said first strip being positioned adjacent to and forwardly of the ball of a foot positioned within the shoe and said second strip being positioned adjacent to and rearwardly of the ball of the foot, said first and second strips together defining a pocket therebetween for receiving the ball of the foot such that said first strip exerts pressure along the forward side of the ball within the pocket and said second strip exerts pressure along the rearward side of the ball when the shoe is laced to thereby restrict pronation of the ball of the foot.

4,255,877

ATHLETIC SHOE HAVING EXTERNAL HEEL COUNTER

William J. Bowerman, Eugene, Oreg., assignor to BRS, Inc., Beaverton, Oreg.

Filed Sep. 25, 1978, Ser. No. 945,468
Int. Cl.[3] A43B *5/00, 13/08*
U.S. Cl. 36—129 12 Claims



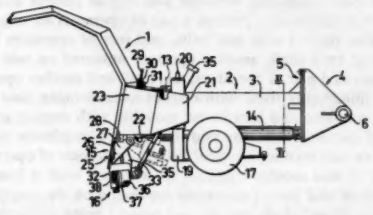
1. An athletic shoe constructed for running comprising:
a shoe upper;
a sole attached to said upper including an outer sole layer extending substantially the full length of the shoe; and
an external heel counter member made of a resilient elastomer material different from that of the shoe upper and being a separate member from said outer sole layer, said heel counter member being attached to the exterior of the heel portion of the shoe upper on both sides of such shoe upper and extending completely around the heel so it terminates in front of the ankle of the wearer's foot.

4,255,878

COMBINATION PLOUGH

Oscar Mähler, Fack, and Lars Furberg, Risgatan, both of Sweden, assignors to AB Mahler & Soner, Rosson, Sweden

Filed Jan. 9, 1979, Ser. No. 3,424
Claims priority, application Sweden, Jan. 12, 1978, 7800355
Int. Cl.[3] E01H *5/04*
U.S. Cl. 37—42 VL 8 Claims



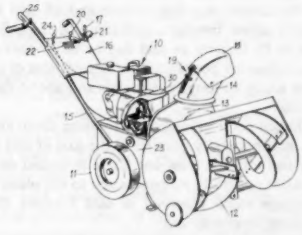
1. In a plough assembly of the kind which during use is raised and lowered relative to a surface to be ploughed or cleared: a wing having a forwardly facing surface and a lower edge; a steel share carried by said wing adjacent the lower edge thereof, said steel share having a lower scraping edge permanently disposed below the lower edge of said wing, said steel share comprising a plurality of sections arranged end-to-end and means mounting each section for swinging movement in a vertical plane about a generally horizontal axis whereby each section can swing upwardly and rearwardly when meeting an obstacle; a mud share pivotally connected to said wing for swinging movement about a generally horizontal axis between an operative position in which at least a portion of said mud share is disposed below the lower edge of said steel share and an inoperative position in which said mud share is disposed above and rearwardly of the lower edge of said steel share, and means for swinging said mud share between said operative and inoperative position.

4,255,879

SNOW BLOWER DEAD MAN CONTROL

Charles A. Greider, Des Moines, Iowa, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,390
Int. Cl.[3] E01H *5/09*
U.S. Cl. 37—43 R 1 Claim



1. In a snow blower unit having a front auger, rear wheels, an engine for driving said auger and wheels, and a rearwardly extending handle on said unit, a pair of pulleys on said unit, one of said pulleys having a drive and no drive connection with said rear wheels which includes a first manually operable

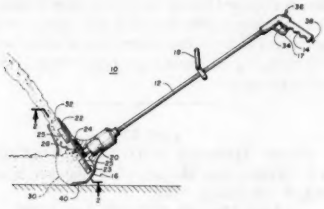
control on said handle having a forward, reverse, and neutral drive position, the other of said pulleys having a drive connection with said auger, a pair of clutches and a clutch selector mechanism therefor adjacent said pulleys for engaging and disengaging said pulleys with said engine, a second manually operable control on said handle for operating said clutch selector mechanism, a third manually operable control on said handle for operating said clutches in accordance with the setting of said selector mechanism as determined by the selected position of said second control, and means automatically disengaging said clutches upon hand release of said third control, said pair of clutches and clutch selector mechanism therefor comprising another pair of pulleys on said engine, a pair of pulley belts extending between said engine pulleys and unit pulleys, a pair of idler pulleys, a pair of operators for engaging said idler pulleys with said belts, said pair of operators being mounted on a shaft, another operator mounted on said shaft between said pair of operators, said shaft and another operator being immovably fixed with respect to each other, said shaft being rotatable and lengthwise movable with respect to said pair of operators whereby said shaft can be lengthwise moved to move said another operator between said pair of operators, means on said another operator for interlock with at least one or both of said pair of operators depending on the lengthwise position of said shaft, said second control being connected to said shaft to lengthwise move the same, and said third control being connected to said another operator to move those of the pair of operators interlocked therewith.

4,255,880

PORTABLE ROTARY SNOW THROWER

Robert L. McMickle; Gary B. Ader, and Steven L. Grice, all of Spirit Lake, Iowa, assignors to Berkley and Company, Inc., Spirit Lake, Iowa

Filed Jun. 25, 1979, Ser. No. 51,375
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—43 B **3 Claims**



1. A portable snow throwing device, said device comprising, in combination:

a handle;

a housing means attached to one end of said handle, said housing means having a collecting opening for receiving snow to be thrown as said device is advanced and a discharge opening positioned at the midpoint of said housing means along its longitudinal axis and above the collecting opening;

a disc shaped rotor mounted for rotation about an axis of said rotor disc generally parallel to the axis of said handle, said rotor including at least one blade mounted on the face of said rotor generally perpendicular to the plane of the rotor to engage snow received in said housing through said collecting opening; and

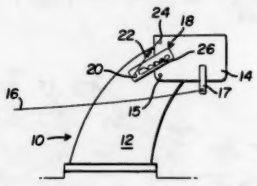
reversible drive means constructed and arranged to rotate said rotor about its axis to throw snow engaged by said rotor through the discharge opening of said housing to one side of said device when said rotor is rotated in one direction of rotation and to the other side of said device when said rotor is rotated in the opposite direction.

4,255,881

ADJUSTMENT MECHANISM FOR CHUTE DEFLECTOR

Mark R. Fralish, Berlin, Wis., assignor to J. I. Case Company

Filed Nov. 30, 1979, Ser. No. 99,066
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—43 R **4 Claims**



1. In a snow thrower machine having an exhaust chute for expelling snow and a deflector pivotally mounted at the exhaust end of the chute to direct the discharged snow outwardly in a desired path, a flexible cable being connected at one of its ends to the deflector, the improvement comprising:

an adjustment mechanism connected between the chute and pivotal deflector, said adjustment mechanism including a ratchet block and a pin, said ratchet block being pivotally secured at one of its ends to said chute and said pin being fixed to said deflector;

said ratchet block having a slot and a plurality of locking teeth along said slot, said pin extending into said slot for selective locking engagement with one of said plurality of teeth;

said deflector being swingable along an arc between minimum and maximum angular deflecting positions and said deflector being biased towards said minimum angular deflecting position by tension spring means connected between said chute and said deflector; and

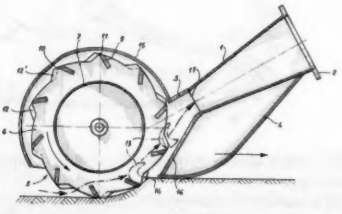
said deflector and said ratchet block being pivotal in response to pulling on said flexible cable thereby permitting said pin to engage a selected one of said plurality of locking teeth along said slot to secure said deflector at a selected angular deflecting position.

4,255,882

DRAGGING TYPE CUTTER HEAD FOR A SUCTION DREDGER

Pieter Verboom, Alblasserdam, Netherlands, assignor to I.H.C. Holland N.V., Rotterdam, Netherlands

Filed Mar. 2, 1979, Ser. No. 16,740
Claims priority, application Netherlands, Mar. 2, 1978, 7802310
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—66 **8 Claims**



1. A dragging type suction head for a suction dredger, said suction head being mounted at the lower end of a suction tube adapted to extend obliquely downwardly and rearwardly from a vessel, said suction head having a single driven cutter rotat-

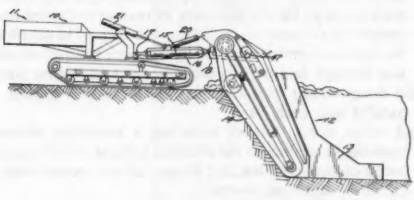
able about a horizontal axis which extends transverse to the direction of dragging, said rotatable cutter having the form of a substantially cylindrical body with transversely extending cutting blades at its outer circumference, said cutter in operation rotating in a direction such that the cutter blades counteract the direction of dragging, said cutter being enclosed by a housing which in the region below the axis of rotation of the cutter leaves free an entrance opening at least at the rear side of the cutter, said housing being connected to the suction tube opposite said rear entrance by a suction tube intake portion of which the lower edge is at a level of a support (4) by means of which the suction head can rest upon unstirred soil in front of the cutter with respect to the direction of dragging, the cutter comprising a closed cylindrical body concentric with said axis of rotation and spaced within the inner edges of the cutter blades.

4,255,883

ATTITUDE CONTROL SYSTEM

David A. Ealy, Greene, Iowa, assignor to ComTec Corporation, Greene, Iowa

Filed Apr. 10, 1978, Ser. No. 895,012
Int. Cl.³ E02F 5/06
U.S. Cl. 37—83 **32 Claims**



1. An attitude control system for controlling the grade of a pitch angle and pitch altitude grade responsive connected member in relation to a reference comprising:

(a) means for sensing the pitch angle component of a connected member having grade determined by a combination of pitch angle and pitch altitude components;

(b) means for maintaining the pitch altitude component of said connected member with respect to a reference;

(c) motor control means for adjusting pitch angle to maintain said connected member at a predetermined grade; and,

(d) means for coordinating changes in the sensed pitch angle component with the motor control means to maintain the amount of pitch angle correction necessary to maintain a pre-determined grade.

4,255,884

APPARATUS FOR UNATTENDED CONVERSION OF A FRONT END LOADER

Earl D. Williams, P.O. Box 1565, Gillette, Wyo. 82716

Filed Nov. 27, 1979, Ser. No. 97,637
Int. Cl.³ E01H 5/00
U.S. Cl. 37—117.5 **7 Claims**

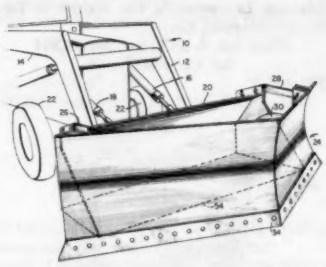
1. An apparatus for the unattended conversion of a front end loader quickly to and from a snowplow or the like, comprising:

an auxiliary blade of the free-standing type, capable of self-support in an operative orientation,

means integral with the top edge of the bucket of the front end loader for grasping an upper portion of said auxiliary blade as such bucket is pivoted upwardly and forwardly, and

means adjacent the bottom of said auxiliary blade for receiving the bottom edge of the bucket of the front end loader as such bucket is pivoted upwardly and forwardly,

whereby attachment and release of said auxiliary blade to and from the bucket of the front end loader are achieved



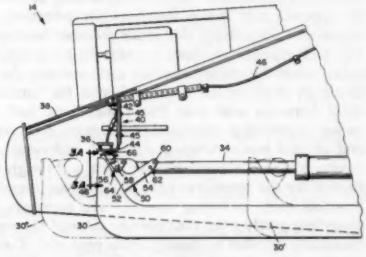
solely by respective opposite pivotal movements of such bucket.

4,255,885

APPARATUS FOR CONTROLLING THE POSITION OF THE PIVOTING FLOOR AND STRIKEOFF BLADE OF AN EARTHMOVING SCRAPER

Roger R. Mitchell, Plainfield; Robert J. Trayler, Braidwood, and Eugene M. Wilson, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT US79/00927, § 371 Date Nov. 1, 1979, § 102(e) Date Nov. 1, 1979
This PCT application filed Nov. 1, 1979, Ser. No. 116,349
Int. Cl.³ E02F 9/28
U.S. Cl. 37—126 AE **7 Claims**



4. In an earthmoving scraper (10) having a frame (38) mounting a bowl assembly (16) which bowl assembly (16) has a pivoted floor (26) a strikeoff blade (27) affixed to said floor (26) and means (30, 32, 34) for pivoting said floor (26) and strikeoff blade (27), the improvement comprising:

switch means (36) for controlling the position of said floor (26);

first means (40) for securing said switch means (36) to one of said frame (38) or said bowl assembly (16);

actuating means (66) for actuating said switch means (36);

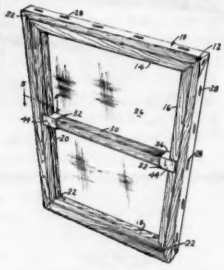
second means (59, 64) for selectively securing said actuation means (66) to the other of said frame (38) or said bowl assembly (16);

wherein said second securing means (50, 64) includes a bracket (50) secured to the other of said frame (38) and said bowl assembly (16), which bracket (50) defines a first leg (52) and a second leg (54), and wherein said second securing means (50, 64) includes an adjuster plate (64) to which said actuating means (66) is mounted and means (74) for mounting said second bracket (64) to each leg (52, 54) of said bracket (50) in one or more positions.

4,255,886
ARTIST CANVAS STRETCHER FRAME BRACE BRACKET

Wallace Klarman, Lawrenceville, Ga., assignor to Tara Materials, Inc., Lawrenceville, Ga.

Filed Feb. 9, 1979, Ser. No. 10,814
Int. Cl.[3] D06C 3/08
U.S. Cl. 38—102.3 1 Claim



1. In a frame arrangement:

a rectangular frame comprising side frame members connected at respective corners, said frame being subject to expansion and contraction whereby said side frame members may move closer together or further apart in response to the environmental conditions,

a fabric material such as artist-canvas, positioned on and attached to said frame along and between respective edges of the side frame members, said canvas being subject to expansion and contraction whereby said side frame members may be moved,

a brace member positioned for movement on said frame concealed behind said fabric and extending between a pair of opposed side frame members for selective, manual movement therealong, said brace member having respective ends adjacent a respective side frame member,

bracket means movably receiving and retaining the respective ends of the brace member therein for limited movement between said side frame members, said bracket means comprising individual brackets on each respective end of said brace member and each individual bracket having a closed tubular portion with a through opening therein for the respective ends of said brace member, said brackets each including spaced, side members thereon extending partly over the opposite sides of the respective side frame member to loosely retain each end of said brace member on said respective side frame member whereby said brace member is normally movable a limited amount in place between said opposed side frame members and without fasteners, such as screws, in the frame; whereby said brace member is not fastened or rigidly attached to said side frame member so that there is a small amount of limited movement, said brace thereby being adjustable along substantially the entire length of the respective side frame members but being prevented from disengagement therefrom.

4,255,887
ILLUMINANT DISPLAY DEVICE AND MOTOR LICENSE PLATE USING SAME

Tetsunosuke Murai, Tokyo, Japan, assignor to Nihon Number Plate Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1979, Ser. No. 32,682
Claims priority, application Japan, Jul. 28, 1978, 53/103058[U]; Mar. 26, 1979, 54/34305
Int. Cl.[3] G09F 13/08
U.S. Cl. 40—206 4 Claims

1. For a vehicle with a power supply circuit, headlamps, parking lamps and a switch for connecting the headlamps and parking lamps to the power supply circuit, an illuminant license plate device comprising:

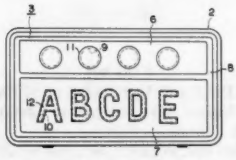
a license plate of an opaque material having perforations in the shape of identifying characters;

a light source located inward of said license plate for projecting light toward said translucent pieces;

switch means in the power supply circuit for energizing the light source;

a delay circuit in the power supply circuit to maintain the switch means to the light source in a closed state for a predetermined time period after said headlight or parking light has been turned off; and

a light distributor plate interposed between said light source



and said license plate and having a transparent masking sheet adhered to a position opposite said light source, said masking sheet having a density increasing in degree from peripheral portions toward the center thereof to distribute the light uniformly from said light source before transmission through said translucent pieces in said license plate;

said delay circuit including a capacitor and a resistor in parallel with each other;

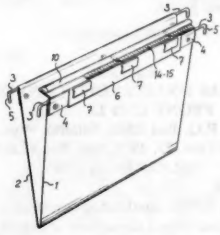
said delay circuit further including a switching element operable in relation to the terminal voltage of said capacitor to control opening and closing of said power supply circuit of said light source;

said translucent pieces being heat pressed to the license plate at the perforations for securing the pieces in the plate.

4,255,888
INDICATOR FOR VERTICALLY SUSPENDED FILE ENVELOPES

Jacques J. Bastogne, B.P.10199, Kinshasa (Republic of Zaire), Congo

Filed Oct. 19, 1978, Ser. No. 952,629
Claims priority, application Belgium, Oct. 28, 1977, 860244
Int. Cl.[3] B42F 21/00
U.S. Cl. 40—359 6 Claims



1. An indicator for use with a vertically suspended file envelope, the indicator comprising,

an elongated body,

means for mounting the body on the file envelope,

the said elongated body being provided with a leg extending horizontally with respect to the envelope and having a generally horizontal free edge spaced from said envelope,

a transparent projection extending from the free edge of the

leg over a part of the leg to define together with the leg a label holder adapted to receive an elongated label therein,

a plurality of markers disposed in spaced locations, each marker being mounted on said leg for movement between a first position in which it covers a portion of the label in said label holder and a second position in which said portion of the label is completely uncovered, the status of the file being adapted to be determined from the positioning of the markers relative to the label,

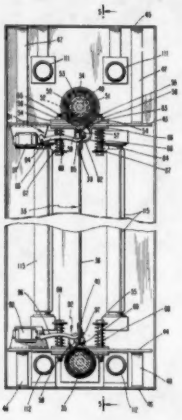
said leg having a plurality of spaced parallel slots with upward converging faces and the part of said marker engaging said slot being of corresponding shape.

4,255,889

CHANGEABLE DISPLAY

Corrigan D. Logan, Tuscaloosa, Ala., assignor to Roll-A-Vision, Inc., Tuscaloosa, Ala.

Filed Nov. 28, 1977, Ser. No. 855,786
Int. Cl.³ C09F *11/18*
U.S. Cl. 40—518 **20 Claims**



1. A changeable display in the form of multiple frames together forming a sheet, comprising a pair of take-up rollers on which the sheet is adapted to be wound, said take-up rollers having parallel axes separated by the distance of at least one of the frames, means for driving at least one of the take-up rollers, a separate idler roller for each of said take-up rollers, each of said idler rollers having an axis parallel to the axis of its associated take-up roller so that a nip is formed between each idler roller and its associated take-up roller, said sheet being transferred between the take-up rollers so that the radius of the material wound on said take-up rollers is variable, and means for urging each of the idler rollers toward the periphery of the wound material on its associated take-up roller while the sheet is being transferred between the take-up rollers to maintain a nip having a constant separation between each idler roller and the adjacent periphery of the sheet wound on its associated take-up roller regardless of the radius of the material on the take-up rollers.

4,255,890

TROLLING PLANER AND RELEASE

Bert A. Smith, 2681 Merriman Rd., Medford, Oreg. 97501

Filed May 21, 1979, Ser. No. 41,093
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—43.12 **13 Claims**

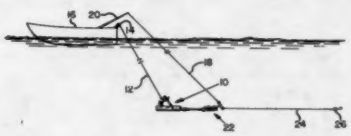
1. A trolling planer comprising:

an elongated weighted body;

a diving plane connected above said body and positioned at an angle such that the front edge of said plane is nearer the body than its rear edge;

attachment means atop said planer for attaching said planer to a downrigger cable; and

releasable holding means connected to the rear end of said



body for holding a fishing line during trolling and for releasing said line when a fish is hooked;

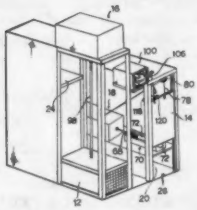
the weight of said body being longitudinally distributed so as to at least partially counteract the downward inclination of the diving plane when the planer is pulled through the water.

4,255,891

AUTOMATIC ANIMAL-TRAPPING DEVICE

Chang C. Chen, No. 7, 12 La., Tsuey Hwa St., Pan Chiao Shih, Taipei Hsien, Taiwan

Filed May 30, 1979, Ser. No. 43,932
Int. Cl.³ A01M *23/04, 23/14*
U.S. Cl. 43—64 **9 Claims**



9. An automatic animal-trapping device comprising

lower and upper compartments,

said lower compartment including

a first hallway having an entrance to the animal-trapping device,

a second hallway communicating with said first hallway,

said upper compartment including

a third hallway,

an elevator for transporting the caught animal from said second to said third hallway,

a first automatic control mechanism to operate said elevator,

a pedal switch set within said elevator to operate said automatic control mechanism to raise said elevator,

a lifting plate controlling said entrance at said first hallway,

a second automatic control mechanism to operate said lifting plate,

a second pedal switch located within said third hallway connected to said automatic control mechanisms to lower said elevator and raise said lifting plate.

4,255,892

HUMANE ANIMAL TRAP

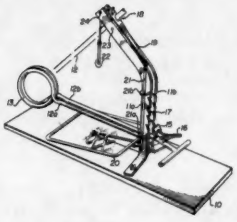
Vital J. Thebeau, Nackawic, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 13, 1979, Ser. No. 66,089
Int. Cl.³ A01M *23/24*
U.S. Cl. 43—81 **3 Claims**

1. A humane animal trap comprising:

(a) a base,

(b) an upstanding frame member mounted on the base,
(c) a metal anvil bar connected at one end to the frame and extending outwardly generally parallel to the base,
(d) a metal striker bar positioned above and generally parallel to the anvil bar,
(e) a spring connected to the anvil bar and the striker bar and adapted to urge the striker bar forcibly towards the anvil bar,
(f) a trigger arm mounted on and extending upwardly along the frame,
(g) a trigger pan mounted below the two bars and connected to the trigger arm,



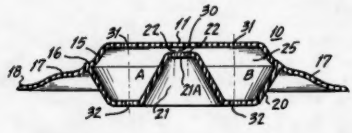
(h) a latch arm swivelly mounted on the upper portion of the frame and containing a notch or recess such that when the striker arm is moved upwards against the force of the spring away from the anvil bar to the set position, the arm fits into the notch, said latch arm having an extended portion contacting the upper end of said trigger arm such that the trigger arm is operative to trigger the latch arm from the set position on movement of the trigger pan and allow the latch arm to swing free and the striker bar to move towards the anvil, and
(i) clamping means for forcibly holding the striker bar down towards the anvil bar to provide a secondary killing action.

4,255,893

FLYING SAUCER CAPABLE OF PERFORMING AERIAL ACROBATIC MANEUVERS

William E. Anderson, 21 Franklin St., Trenton, N.J. 08611, and Richard C. Caran, 861 Revere Ave., Trenton, N.J. 08629

Filed Jan. 28, 1980, Ser. No. 115,873
Int. Cl.[3] A63H *27/00*
U.S. Cl. 46—74 D **10 Claims**



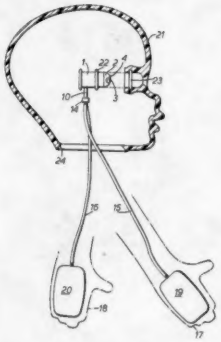
1. An aerodynamic flying saucer apparatus, comprising:
a top section comprising a relatively circular planar member having a flat top surface surrounded by a smooth downwardly extending flange, an outwardly extending wing section extending symmetrically about said flange of said top section, a bottom annular section extending downwardly from said wing section with a central cone shaped recessed region having a central top wall extending near said flat top surface, with said bottom and top sections forming an annular cavity about said cone shaped region with said cavity having a reduced portion at the center due to said central top wall of said cone shaped recessed region in proximity with said flat top surface, said flat top surface having a plurality of apertures communicating with said cavity, with said bottom section having on a surface, a first plurality of apertures communicating with said cavity and having on said central top wall, a second plurality of apertures, with said first apertures relatively aligned with said apertures in said flat top surface, to cause turbulence to be provided in said cavity when said saucer is thrown by a user, said turbulence due to said apertures in said top and bottom sections and said apertures in said central top wall of said cone shaped recess region.

4,255,894

EYE ASSEMBLIES FOR DOLLS

Adolph E. Goldfarb, 4614 Monarca, Tarzana, Calif. 91356; Erwin Benkoe, deceased, late of Encino, Calif. (by Elisabeth Benkoe, executrix), and Elonne Dantzer, Hermosa Beach, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif. and Elisabeth Benkoe, Encino, Calif., executrix for the estate of Erwin Benkae

Filed Dec. 27, 1977, Ser. No. 864,251
Claims priority, application United Kingdom, Dec. 29, 1976, 54201/76
Int. Cl.[2] A63H *3/40*
U.S. Cl. 46—169 A **2 Claims**



1. An eye assembly, intended for use in a doll, wherein the assembly comprises a combined representational eyeball and eyelid movably mounted relative to a carrier, and weighted, in such a way as to tend to occupy a first positional relationship with the carrier in one attitude of the assembly to the horizontal but to occupy a second positional relationship with said carrier in a different attitude of the assembly to the horizontal, fluid pressure actuable means operable to displace the combined eyeball and eyelid from said first positional relationship to said second positional relationship, and fluid pressure initiating mechanism spaced from the combined eyeball and eyelid and operatively associated with said fluid pressure actuable means in such a way as to be selectively manually operable to cause said fluid pressure actuable means to effect such displacement when the assembly is in said one attitude to the horizontal, said assembly comprising two eyeball and eyelid combinations and corresponding fluid pressure actuating means that can be operated selectively by either of two separate initiating mechanisms to cause displacement of either only one, or both, of said two combinations, each of said eyeball and eyelid combinations comprising a projection, said projections being disposed in overlapping relationship, each fluid pressure actuating means being positioned to cooperate operatively with a corresponding one of the projections whereby actuation of one of said means will cause displacement of only one of the two combinations whereas actuation of the other means will cause displacement of both combinations.

4,255,895

LIGHTING UNIT FOR FLIGHT TOY OR THE LIKE

John F. LaBrecque, 22542 Audrey St., Warren, Mich. 48091

Filed Jul. 2, 1979, Ser. No. 54,031
Int. Cl.[3] A63H *33/26*
U.S. Cl. 46—228 1 Claim

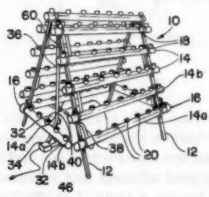
1. In a concave disc or saucer-shaped flight toy having illuminating means mounted thereon; the improvement wherein the flight toy has a single bolt receiving opening therethrough at the center of rotation of said toy, and said illuminating means comprises an elongate hollow metal tube, a pair of electric batteries slidably received within said tube in end to end relationship with each other, means defining a threaded axial opening in each end of said tube, and electric bulb threadably received in each of said threaded openings, means defining a bolt receiving opening extending diametrically through said tube midway of the length thereof, a bolt adapted to pass through the bolt receiving openings in said tube and said toy to pass through said tube between the adjacent ends of said batteries, a nut adapted to be threadably received on said bolt to detachably clamp said tube against a surface of said toy, the axial length of said tube being such that when said bolt is received in the bolt receiving opening of said tube, the distance between one side of said bolt and the adjacent threaded opening exceeds the length of one of said batteries by a distance such that the bulb received in the threaded opening may be selectively threaded into or out of electric contact with the adjacent end of the battery disposed between said bulb and said bolt to make or break an electric circuit extending from one terminal of said battery through said bulb, the wall of said tube and said bolt to the opposite terminal of said battery.

4,255,896

HYDROPONIC GROWING APPARATUS

Vincent P. Carl, 2633 Whidby La., Anaheim, Calif. 92806

Filed Jun. 12, 1979, Ser. No. 47,914
Int. Cl.[3] A01G *31/00*
U.S. Cl. 47—62 8 Claims



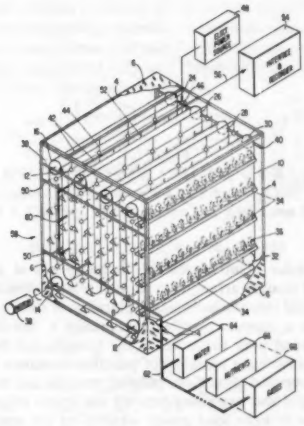
1. A hydroponic growing apparatus comprising:
a hollow duct including an inlet and outlet positioned adjacent opposite ends of said duct to define a series flow path through said duct;
means for circulating a liquid through said inlet and said outlet; and
planting cup means removably mounted to said duct for supporting an inert media and a plant within said duct, said planting cup means including aperture means for permitting said liquid to be drawn by capillary action into said media while prohibiting said media from entering said liquid in said duct and for permitting the roots of the plant to extend through said aperture means below said cup means into the lower portion of said duct;
said planting cup means sized to provide a drainage area within said duct below said aperture means; and
means for cyclically varying the level of liquid between a first level wetting a portion of said media and a second lower level wetting only the extended roots but not said media at predetermined, time intervals to continuously maintain a sufficient quantity of liquid within said duct to prevent dehydration of said plant.

4,255,897

METHOD AND APPARATUS FOR THE IMPROVEMENT OF STORAGE OF BIOCHEMICAL ENERGY IN PLANTS

Othmar Ruthner, 150, Sieveringerstrasse, A1190 Vienna, Austria

Continuation-in-part of Ser. No. 902,858, May 4, 1978, abandoned. This application Oct. 29, 1979, Ser. No. 89,085
Claims priority, application Austria, May 12, 1977, 3405/77
Int. Cl.[3] A01G *31/02*
U.S. Cl. 47—65 16 Claims



1. An installation for the cultivation of plants comprising:
a framework defining a cultivation space;
a covering over said framework enclosing said cultivation space;
a space lattice formed of a plurality of plants located within said cultivation space, said plants being movably arranged to circulate in a continuous manner along a vertical serpentine path within said cultivation space;
drive means connected to said space lattice of plants for causing said plants to circulate in said vertical serpentine manner;
an illumination space lattice formed of a plurality of light sources structurally interconnected, electrically connected to a power source, and arranged in a interstitial manner adjacent said space lattice formed of a plurality of plants for illuminating said plants;
a measuring space lattice arranged substantially coextensive which said illumination space lattice so as to be also arranged in an interstitial manner adjacent said space lattice formed of a plurality of plants and having a plurality of measuring devices structurally interconnected and each producing an output indicative of the state of a preselected parameter of said cultivation space;
a display means connected to receive the outputs from said

measuring devices for producing a display indicating the quantitative results of the preselected parameters being measured; and

an environmental factor space lattice formed of interconnected tubes connected to sources of water and nutrients including means for selectively causing said sources to feed said environmental factor space lattice, said environmental factor space lattice being arranged substantially coextensive with said illumination space lattice and said measuring space lattice and arranged in an interstitial manner adjacent said space lattice formed of a plurality of plants, said tubes having opening therein at preselected locations for discharging water and nutrients into the cultivation space, whereby the formation of photosynthesis products for energy storage by the plants is at a maximum value, while the energy reducing respiration processes of the plants are reduced to a minimum.

4,255,898

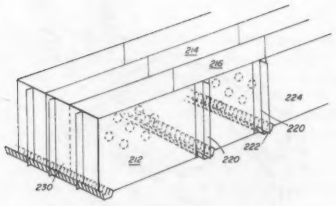
MODULAR PLANT DEVICE

George Greenbaum, 790 Boylston St., Boston, Mass. 02199

Division of Ser. No. 763,821, Jan. 31, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 923,052

Int. Cl.³ A01G *9/02*

U.S. Cl. 47—85 **7 Claims**



1. A modular plant device which comprises at least two longitudinal troughs arranged in parallel relationship, the walls of each of said troughs including a plurality of slits in opposed relationship, a support member comprising a film-like sheet material draped over the walls of the troughs and forming a floor therebetween, a plurality of partition members received within the opposed slits of the parallel troughs and transverse to the troughs and extending beyond the upper edges of the walls of the troughs, end plates secured to the ends of the partition members to define with the members and the sheet material an enclosed channel, the sheet material secured between the partition members and the slits receiving said members.

4,255,899

ACTUATORS

Philip Braithwaite, Strensham, England, assignor to Tungum Hydraulics Limited, Cheltenham, England

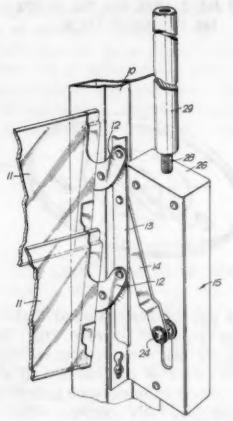
Filed Sep. 21, 1979, Ser. No. 77,595

Claims priority, application United Kingdom, Sep. 21, 1978, 37582/78

Int. Cl.³ E05F *15/20*

U.S. Cl. 49—2 **7 Claims**

1. A thermally sensitive actuator for opening and closing a louvre window of the type in which the louvre blades are mounted fast with bell-cranks having their free ends pivotally connected to an operating member which has a pivotal link coupled thereto, said thermally sensitive actutator comprising: a housing for mounting on the frame of the window having at least one side wall and containing a channel of uniform cross-section; a block slideably mounted in the channel; and a piston and cylinder assembly, the cylinder of which contains a thermally expansible flowable material and is mounted on the housing with the piston in engagement with the slideable block so that expansion of the flowable material causes displacement of the block, the side wall of the housing containing an elongate slot through which projects a pivot pin which is coupled to said block and has connecting means on its projecting end for attachment to the pivotal link of the louvre window.



4,255,900

SAFETY DEVICE FOR OPENING OF REVOLVING DOORS

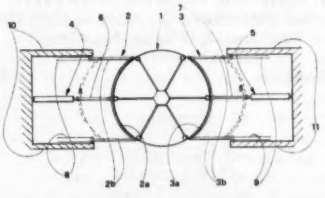
Carla Magnani, Carpi, Italy, assignor to Elettromeccanica Mausoli S.r.l., Carpi, Italy

Filed Mar. 5, 1979, Ser. No. 17,271

Claims priority, application Italy, Mar. 3, 1978, 40032 A/78

Int. Cl.³ E05B *65/10*

U.S. Cl. 49—141 **9 Claims**

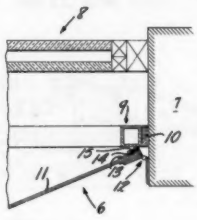


1. A safety device for a revolving door positioned in an access space for rotation about a given vertical axis, the device comprising at least one horizontally moveable vertical closure component positioned adjacent said revolving door, said closure component having a vertical profiled surface which defines a horizontal extent of said access space; drive means coupled to said vertical closure component for selectively displacing said closure component linearly in a horizontal direction from a position in which said profiled surface is immediately adjacent said revolving door to a position in which a gap defining a passageway is provided between said profiled surface and said revolving door; and command control means coupled to said drive means for energizing same selectively.

4,255,901
WINDOW DEVICE

Sven-Eric Stenberg, Gimlevägen 21, Danderyd, Sweden

Filed Sep. 26, 1978, Ser. No. 945,816
Claims priority, application Sweden, Sep. 29, 1977, 77108751
Int. Cl.³ E05D 7/00
U.S. Cl. 49—402 6 Claims

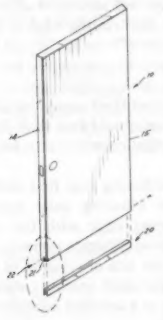


4. In combination with a window framed in a jamb, a device for thermal and acoustic insulation of the window comprising a frame, a corresponding pane, and means for securing the pane in sealing relation with respect to the frame, said frame having: (a) hollow corner and intermediate sections of matched rectangular cross-sectional dimension; (b) connecting elements inserted in the sections for aligning the corner and intermediate sections together, wherein adjacent sections may be moved together or apart to vary the height and width of said frame; and (c) spacer sections adapted to be positioned between adjacent hollow sections and to fit over exposed lengths of the connecting elements between the corner and intermediate sections, said spacer sections being of matched cross-sectional dimension with the other sections, thereby to make the height and width of said frame adjustable to the contour of the jamb.

4,255,902
WEATHER SEALING ASSEMBLY FOR DOORS

Robert O. Ruff, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,649
Int. Cl.³ E06B 7/16
U.S. Cl. 49—488 5 Claims



1. In a metal door of the type having a channel formed in the bottom rail and a weather sealing assembly arranged and constructed to be adjustably mounted in said channel to sealingly engage a threshold when said door is mounted in a door jamb in its closed position, said weather sealing assembly comprising:

a generally U-shaped, elastomeric housing having an outer configuration complementary to said door channel and a horizontally extending rail integrally molded with said housing to define a generally rectangular section for retaining a rigid support member therein;

said elastomeric housing adapted to be vertically adjustable therein including a pair of spaced, generally parallel, resilient and flexible lips which extend away from the bottom rail of said door and adapted to make sealing engagement with said threshold.

said rigid support member slidably mounted in said generally rectangular section of said elastomeric housing, said rigid support member including a plurality of longitudinally extending slots formed around its outer surfaces and having a generally cross section complementary with said rectangular section of said housing, said at least one of said slots providing such anchor means for receiving said latching member for adjustably mounting said weather sealing assembly in position in the bottom edge surface of the door;

said rigid support member including anchor means for receiving a latch member for mounting said weather sealing assembly in adjusted fixed position;

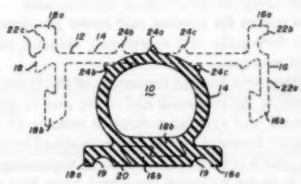
a compressible foam strip positioned in said channel and mounted between the upper outer surface of said housing and the bottom surface of said channel to prevent cold air and water from passing between the housing and the channel formed in the bottom rail of said door; and

said latch member mounted to said anchor means to position said weather sealing assembly in said door channel in fixed adjusted position so that said flexible lips are positioned in sealing engagement with said threshold to prevent air and water from passing therebetween.

4,255,903
SNAP-TOGETHER SEALING GASKET

Clarke Reynolds, 15 St. Bernard La., Tiburon, Calif. 94920, and Richard J. Quigley, 25538 Adobe La., Los Altos Hills, Calif. 94022

Filed Jul. 18, 1979, Ser. No. 58,534
Int. Cl.³ E06B 7/16
U.S. Cl. 49—498 10 Claims



1. A bulb-type, linear sealing strip for securing to the surface of a member adapted to close an opening in a wall structure, said sealing strip:

being formed from a generally planar strip of elastomeric, resilient material having opposite end portions which extend substantially at right angles to said planar strip, said end portions each having an upper section extending above said planar strip and a lower section extending below said planar strip;

the lower sections being shaped to form cooperating male and female locking elements which, upon being snapped together when the strip is rolled about its longitudinal axis, deform said planar strip into a bulb-type shape; and

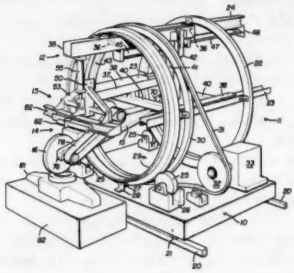
the upper sections being substantially identical to one another and being shaped to form a pair of flanges for mounting said gasket to the surface of the member, said mounting flanges extending into opposite directions for mounting to the member when said locking elements are snapped together.

4,255,904

UNIVERSAL POSITIONING SUPPORT FOR GRINDER WHEELS

William E. Dougherty, 1681 Oxford, Grosse Pointe Woods, Mich. 48236

Filed Nov. 23, 1979, Ser. No. 96,641
Int. Cl.[3] B24B 7/02
U.S. Cl. 51—35 11 Claims



1. An apparatus for universally positioning and supporting a rotating type tool, such as a grinding wheel and the like, comprising:

a horizontally arranged support base;

a rotatable cage supported upon said support base for rotation around a horizontal central axis, with said cage including at least one large ring-shaped member arranged in a fixed vertical plane for rotation about its own horizontal central axis;

and power means for rotating said ring-shaped member and the cage for a predetermined limited angle or rotation;

a horizontally reciprocal frame, having a forward end and a rearward end, arranged within said cage and surrounded by said ring-shaped member;

means mounting said frame upon said ring-shaped member for guided movement of the frame forwardly and rearwardly along the direction of the ring axis;

powered means for moving said frame pre-determined distances forwardly and rearwardly relative to said ring-shaped member;

an elongated arm located forwardly of the frame and means connecting the rearward end of the arm to the frame for horizontal and vertical movement relative to the frame;

the opposite, free end, of the arm extending forwardly of the frame, and a rotatable tool, such as a grinding wheel and the like, being mounted upon said lever free end upon a fixed axis of rotation;

said means for moving the arm including a guide means secured to the forward end of the frame for generally horizontally directed movement, and a vertical guide member connected to said guide means for upwards and downwards movement relative to said frame;

powered means for moving said vertical guide member up and down and powered means for moving said horizontally moving guide means member pre-determined distances along said frame;

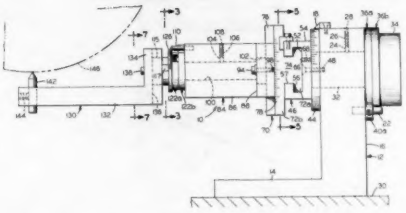
wherein movement of said horizontally moving guide means moves the free end of the arm in a generally horizontal direction, with movement of said vertical guide member means causing the free end of the lever to move up and down, and forward and rearward movement of the frame causes the arm, including its free end to move forwardly and rearwardly, with rotation of the ring-like member rotating the arm relative to the axis of rotation of the cage, for thereby universally positioning the tool blade mounted upon the arm free end.

4,255,905

METHOD OF RADIUS AND ANGLE DRESSING

Ronald E. Kerner, 57 Grove St., Plainville, Conn. 06062

Division of Ser. No. 868,987, Jan. 12, 1978, Pat. No. 4,180,046, which is a continuation-in-part of Ser. No. 671,304, Mar. 29, 1976, abandoned. This application Sep. 17, 1979, Ser. No. 76,295
Int. Cl.[3] B24B 53/06
U.S. Cl. 51—325 7 Claims



1. In a method of dressing a grinding wheel or the like to provide two different radii surfaces thereon, the steps comprising:

(a) mounting a cutting tool having a cutting edge on a tool support member of a radius and angle dresser having a support member in which a first shaft is mounted for rotation and has a second rotatable shaft mounted at one end thereof, the respective axes of rotation of said shafts being parallel and said second shaft being selectively shiftable radially of the axis of rotation of said first shaft between positions lying in a first plane extending to opposite sides of said axis of rotation of said first shaft while maintaining said axes of rotation parallel, said second shaft being oscillatable independently of said first shaft, and first and second locking means associated, respectively, with said first and second shafts and operable to limit rotary oscillation of said shafts;

(b) zeroing said dresser rotationally centering said first and second shafts;

(c) positioning said cutting tool relative to said second shaft to position said cutting edge thereof at a selected elevation relative to the axis of rotation of said second shaft and disposed at an angle to the axis of both of said shafts;

(d) radially shifting said second shaft relative to said first shaft to position said cutting edge at a selected elevation relative to the axis of rotation of said first shaft;

(e) positioning a grinding wheel or the like to be dressed adjacent to said cutting edge;

(f) locking said second shaft against rotation relative to said first shaft and freeing said first shaft for a selected degree of rotational oscillation relative to said supporting member;

(g) rotationally oscillating said first shaft about its axis of rotation without effecting axial movement thereof to engage said cutting edge with the associated grinding wheel or the like to generate thereon a radius surface set with respect to the axis of rotation of said first shaft;

(h) locking said first shaft against rotation relative to said support member at a selected rotational position along its path of oscillation;

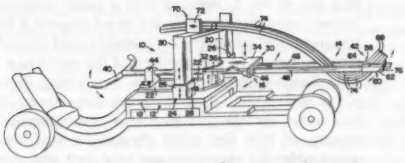
(i) freeing said second shaft for a selected degree of rotational oscillation relative to said first shaft; and

(j) rotationally oscillating said second shaft about its axis of rotation without oscillating said first shaft to engage said cutting edge with the associated grinding wheel or the like to generate thereon a radius surface set with respect to the axis of rotation of said second shaft, the first and second radius surfaces being generated without intervening repositioning of said cutting tool relative to said shafts.

4,255,906
ABRASIVE CLEANING APPARATUS

Wayne B. Hockett, 1905 N. 43rd St., Tampa, Fla. 33605

Continuation-in-part of Ser. No. 746,492, Dec. 1, 1976, Pat. No. 4,126,970, which is a continuation-in-part of Ser. No. 614,191, Sep. 16, 1975, Pat. No. 4,027,432. This application Nov. 27, 1978, Ser. No. 963,689
Int. Cl.[3] B24C 3/06
U.S. Cl. 51—429 25 Claims



1. An apparatus for cleaning a work surface by blasting the surface with an abrasive under fluid pressure from a remote control source of abrasive and fluid, comprising in combination:

a base;

a least one nozzle;

a nozzle support for supporting said nozzle;

conduit means connecting said nozzle to the remote source of abrasive and fluid;

means for rotatably mounting said nozzle support to said base about a first axis of rotation;

means for rotatably mounting said nozzle support about a second axis of rotation for directing the reaction force produced by said nozzle during operation;

means establishing said second axis to form an angle relative to said first axis such that rotation of said nozzle in a first direction about said second axis directs the reaction force of said nozzle during operation thereof to cause a drive force of said nozzle in a first direction about said first axis;

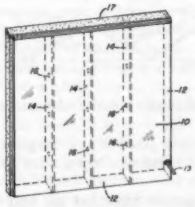
rotation of said nozzle in a second direction about said second axis directs the reaction force of said nozzle during operation thereof to cause a rotation drive force of said nozzle in a second direction about said first axis; and

actuator means for alternately reversing rotation of said nozzle support about said second axis between said opposite drive force directions as a function of said nozzle support rotating to predetermined terminal positions about said first axis, whereby said nozzle support is driven in sweeping strokes across the work surface.

4,255,907
INFLATABLE STORM WINDOW

Wilbur G. Lightell, 138 Sheldon Ave., Pittsburgh, Pa. 15220

Filed Nov. 3, 1978, Ser. No. 957,484
Int. Cl.[3] E06B 3/26
U.S. Cl. 52—2 6 Claims



1. A flexible storm window apparatus for inflated support against surfaces of a window opening; said flexible storm window apparatus including the combination of:

two rectangular flexible facing sheets of transparent plastic material extending in a generally spaced-apart and face-to-face relation,

flexible side walls joined to the peripheral edges of said flexible rectangular facing sheets to define therewith an internal airtight space formed a thermal barrier against heat flow, some of said side walls being heat welded to at least on of said facing sheets,

a plurality of discrete spacing support strips having opposed longitudinal marginal edge portions secured by heat welding to the face surfaces of said rectangular facing sheets, said spacing support strips having a gas permeable opening and extending within said internal airtight space at spaced-apart locations from some of said flexible side walls and between other of such walls to space and support said flexible facing sheets,

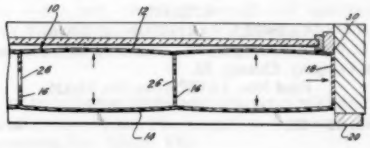
valve means to admit a gaseous medium into said internal airtight space under a sufficient pressure for inflated support against surfaces of a window opening, and

an interface seal strip extending along the outer face surfaces of said flexible side walls to prevent rupture of said side wall of the airtight space for interface sealing between said side walls and the support surfaces therefor defined by the window opening.

4,255,908
WINDOW INSULATING DEVICE

David Rosenberg, 155 W. 68th St., New York, N.Y. 10023

Filed May 4, 1979, Ser. No. 36,037
Int. Cl.[3] E04B 1/34
U.S. Cl. 52—2 9 Claims



1. A heat insulation device adapted to be mounted in a window frame comprising a pair of spaced substantially planar parallel extending face sheets of plastic material, a plurality of plastic connector strips extending perpendicular to and extending between said face sheets, said connector strips contacting and being secured only to said face strips along their opposed edges; and a gusset strip extending between said face sheets along the peripheries thereof and being sealed thereto in an air tight relation, said gusset strip having a firmer hand than said face sheets and being approximately 25% heavier in gauge; and valve means for inflating said device, whereby said connector strips maintain the face sheets in substantially planar configuration upon inflation; said connector strips having free ends which are spaced from the adjacent gusset strips whereby all parts of the device are in air communication with each other and said gusset strip defines a substantially flat planar edge throughout the periphery of the device to form a substantially air tight seal with the window frame or the gusset of an adjacent heat device.

4,255,909
MANHOLD

Gert Söderström, Hammarbyvägen 62, Upplands Väsby, Sweden (S-194 00)

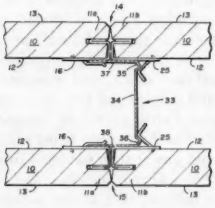
Filed Nov. 3, 1978, Ser. No. 957,051
Claims priority, application Sweden, Nov. 7, 1977, 7712565
Int. Cl.[3] E02D *29/14*
U.S. Cl. 52—20 9 Claims

1. An adjustable manhole comprising:
at least two telescoping tubular members adapted to line a subterranean pit;
an alternating series of ribs and grooves carried by one of said tubular members in the interface between said tubular members, said ribs and grooves being uninterrupted and extending completely around said interface transversely of the longitudinal axes of said tubular members;
a smooth continuous wall carried by the other of said tubular members in said interface opposed to said ribs and grooves permitting free relative axial movement of said tubular members; and
locking means engageable in at least one of said grooves to fix the relative axial positions of said tubular members, said locking means comprising a continuous locking recess carried by said other tubular member extending completely around said interface, and a locking member engageable in said locking recess and in at least one of said grooves.

4,255,910
ACCESSIBLE PARTITION ASSEMBLY

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Nov. 13, 1979, Ser. No. 93,426
Int. Cl.[3] E04B *2/60, 2/78*
U.S. Cl. 52—481 44 Claims

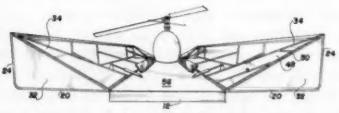


1. An accessible partition assembly comprising:
A. two opposed spaced-apart rows of panels, each panel having opposite vertical edges, and interior and exterior panel faces, adjacent panels meeting at joints in edge-to-edge relationship;
B. a plurality of studs located intermediate said rows of panels, and positioned at joints between a pair of adjacent panels, said studs comprising;
(1) a web integrally interconnecting,
(2) continuous vertical rib portions,
(3) a flange extending from each rib generally parallel planar with, and adjacent to, opposing interior panel faces; and,
C. panel and stud engageable means at each said joint, said engageable means comprising a first and second clip, each clip engaging a stud and one panel edge at a joint,
(1) said first clip comprising
a. a generally L-shaped edge-engaging portion having a first leg of the L inserted into a panel edge and a second leg disposed along the panel edge in a direction inward of said partition assembly, said second leg terminating at the interior face of the panel in a
b. stud flange-engageable portion comprising biplanar plates, a first plate disposed along the interior panel face and a second parallel planar plate disposed inwardly of said first plate forming a stud flange-engageable slot therebetween, said first and second plates extending in a direction substantially the same as the first leg of the L-shaped portion, wherein a stud flange is nested within said slot;
(2) said second clip, engaged with a stud and a panel adjacent a panel engaged by a first clip, said second clip comprising
a. generally L-shaped edge-engaging portion having a first leg of the L inserted into the panel edge and a second leg disposed along the panel edge in a direction inward of said partition assembly, said second leg terminating at the interior panel face in a
b. resilient stud rib-engageable portion comprising a plate disposed along the interior panel face in a direction substantially the same as the first leg of the L-shaped portion, and an integral resilient rib-engaging portion extending from said plate, said resilient portion removably snap-engaged with a stud rib;
whereby panels are demountably engaged to studs by means of a first clip engaged at one vertical edge and a second clip at the opposite vertical edge, wherein the second clip is disengageable by moving a panel outward to disengage the resilient portion from a stud rib, and the first clip, at a joint at the opposite vertical panel edge, is disengageable by sliding the panel sideward to move the slot from nested engagement with a stud flange, and wherein a panel is remountable by reversal of demounting operation.

4,255,911
HELICOPTER ENCLOSURE

John M. Beacom, deceased, late of Salix, Iowa, and Delia A. Beacom, Executrix, R.R. 1, Salix, Iowa 51052

Filed Jul. 3, 1978, Ser. No. 921,303
Int. Cl.[3] E04B *1/346*
U.S. Cl. 52—66 8 Claims



1. A combined landing pad and enclosure for a helicopter comprising,
an elongated rigid generally rectangular base having a substantially flat horizontal top surface defining a landing and takeoff pad,
a housing structure mounted on said base, said housing structure including opposed side walls and opposed end walls extending upwardly from the opposed side and end edges, respectively, of the generally rectangular base, and a roof panel mounted on and supported by said side and end walls, said housing being divided substantially along

its longitudinal vertical center plane into two opposed, complementary housing sections each including a segment of said roof panel and of each said end wall,

said housing structure having a length at least slightly greater than the diameter of the rotor of a helicopter to be enclosed therein and a width which is substantially less than the diameter of the helicopter rotor when the housing sections are in the closed position,

means mounting the respective housing sections for movement about longitudinal, horizontal axes extending one parallel to and adjacent the opposed side edges of said base, said housing sections being moveable between a closed position in which said side walls extend in a generally vertical plane and an open position in which the side walls are pivoted outwardly and downwardly to a substantially horizontal position and said roof panel segments extend generally upward to expose and provide unobstructed access to said landing and takeoff pad and to space the upwardly extending roof panel segments outwardly from said base a distance substantially equal to the full height of said side walls,

power means for moving said housing sections between said closed and said open positions,

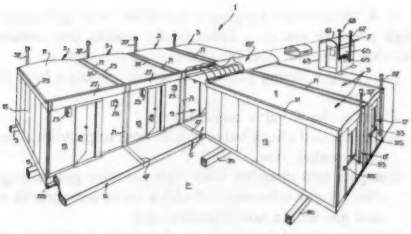
each of said end wall segments comprising a pair of generally triangular panels and means supporting the triangular panels of each said end wall segment for movement relative to one another to reduce the vertical projection of each said end wall segment adjacent said base to a level substantially equal to the level of said base when said housing sections are in the open position.

4,255,912

TEMPORARY SHELTER

Jozsef M. Kovacs, 335 Kensington Ave., Montreal, Quebec, Canada (H3Z 2H2)

Filed Oct. 5, 1979, Ser. No. 82,044
Claims priority, application Canada, Jun. 8, 1979, 329389
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—79.8 **15 Claims**



8. A temporary shelter obtained by assembling, on a selected site, a set of easily transportable modular elements, said shelter comprising:

(a) an even number of base modules of equal size each having an entrance at one end, said base modules being placed side by side in two rows with the base modules of one row facing, in pairs, those of the other row so as to form a hallway, said entrances opening into said hallway;

(b) at least one floor module having the same width as said hallway, each floor module being placed between each pair of facing base modules so as to join said facing modules at the base thereof;

(c) two vestibule-forming modules having substantially the same width as each floor module, said vestibule modules being placed at the ends of said hallway so as to close it;

(d) a first set of thin sheets of flexible sealing material each removably secured between the front, the top and the rear walls of said base modules so as to join them together;

(e) a double sealing roof removably secured over the hallway along the full length thereof, said double roof comprising: a first wide sheet of flexible material having substantially the width of said hallway and spreading thereabove between the upper ends of the front walls of said base modules, and a second wide sheet of flexible sealing material having a width greater than that of said hallway and spreading between the top walls of said base modules in order to sealingly insulate said hallway, and

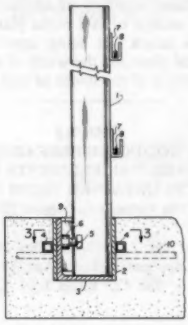
(f) a second set of thin sheets of flexible sealing material removably secured to said base modules and to said vestibule modules so as to join them together.

4,255,913

HOLLOW SLEEVE BRACKETS

Frank Poma, 1346 S. Killian Dr., Lake Park, Fla. 33403

Filed Apr. 2, 1979, Ser. No. 26,413
Int. Cl.³ E02D *27/32*
U.S. Cl. 52—297 **4 Claims**



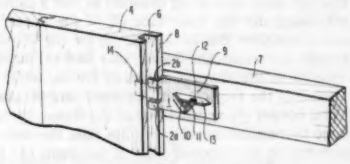
1. A device for releasably mounting a temporary guard chain standard in an open concrete slab, comprising a hollow sleeve bracket member, said hollow sleeve bracket having substantially straight linecross-section design, a guard chain standard having an apertured end portion with opposed members slideably mounted in said hollow sleeve bracket member, a nut secured to said end portion aligned with an apertured end portion, and a bolt extending through said aperture and threaded engaging said nut and abutting said sleeve bracket.

4,255,914

CLIP FOR SECURING PLANAR MEMBERS

Andrew G. Seipos, Miami, Fla., assignor to Automated Building Components, Inc., Miami, Fla.

Filed Oct. 23, 1978, Ser. No. 953,760
Int. Cl.³ E04B *2/58, 1/38*
U.S. Cl. 52—483 **10 Claims**



1. A structural joint comprising: a wooden support member; a first planar member to be secured to said wooden support member and having a grooved section extending along one edge thereof; a clip securing said first planar member to said wooden support members, said clip being formed by a metal plate having struck out therefrom a first portion extending

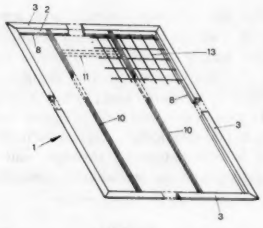
outwardly from one face of said plate and being angularly bent so as to form a generally L-shaped gripping member, said first portion being arranged in engagement with a lower portion of said grooved section of said first planar member, said L-shaped gripping member having a first leg attached to said plate and extending approximately perpendicularly to said plate and a second leg connected to said first leg and extending at an angle of approximately 15° to the plane of said plate; and said metal plate further having struck out therefrom a second portion initially extending outwardly from the same face of said plate as said first portion and in a direction substantially parallel with but opposite to said first portion, said second portion having a free pointed end and initially being angularly bent such that said pointed end points toward a plane in which said metal plate lies and said point end being driven into said wooden support member; a second planar member having a tongue section protruding along one peripheral edge thereof, said tongue section being inserted into said grooved section of said first planar member so that the outer planar surfaces of said first and second planar members are substantially coplanar; and the length of the section of said metal plate from which said second portion is struck out being approximately $\frac{3}{8}$ of the length of said metal plate and the width of said second portion being approximately $\frac{1}{4}$ of the width of said metal plate.

4,255,915

PROCESS FOR PRODUCING PREFABRICATED PANELS AND TRIDIMENSIONAL ELEMENTS FOR BUILDING AND PRODUCTS OBTAINED FROM SAID PROCESS

Angelo Muriotto, Via Antonio da Mestre 19, Mestre (Venezia), Italy

Filed Apr. 2, 1979, Ser. No. 26,063
Claims priority, application Italy, Apr. 18, 1978, 22413 A/78
Int. Cl.³ E04B *5/04*
U.S. Cl. 52—601 **16 Claims**



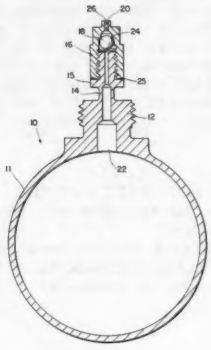
1. A process for producing prefabricated panels of the kind having a peripheral metallic frame (**1**), reinforced with a metallic structure (**10**) and/or a metallic net (**13**), said panel having at least a layer (**15**) of cement mixture or other material, characterized by producing a square or rectangular frame (**1**), the sides of which are formed by shaped metallic sheet, the cross section of each side having the form of an isosceles right-angled triangle, said sides being oriented so that a cathetus of the triangle constitutes the inner face (**2**) of the frame, the other cathetus constitutes the back face (**3**) of the frame and the hypotenuse constitutes the frame outer face (**4**) inclined at 45° with respect to the plane of the same frame, while the acute angle between the face (**2**) and the outer fare (**4**) constitutes a peripheral border (**9**) on the front of the frame; by reinforcing the frame by parallel metallic profiles (**10**), the ends of which are anchored to the opposed sides of the frame (**1**); by cutting one or more of said profiles for delimiting an aperture for a door or a window, said profiles (**10**) having a flange about flush to the back face (**3**) of the frame and the web protruding to a determined level into the space delimited by the frame; by laying a reinforcing metallic net (**13**) immediately under the webs of said parallel profiles (**10**); by disposing the frame so reinforced on a resting plane, resting it with the acute angle peripheral border (**9**), and by pouring a cement mixture into the frame to form a main layer (**15**), the thickness of which, measured from said resting plane, is sufficient to merge said metallic reinforced net and the lower portion of the webs of the reinforcing profiles (**10**).

4,255,916

METHOD OF CHARGING AND HERMETICALLY SEALING HIGH PRESSURE GAS CONTAINER

John E. Blankenship, Fredericksburg, and Roy W. Hoback, Dahlgren, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 954,020, Oct. 23, 1978. This application Feb. 22, 1980, Ser. No. 123,536
Int. Cl.³ B65B *31/02*
U.S. Cl. 53—404 **3 Claims**



1. A method of charging a container with gas under very high pressure and then hermetically sealing the container to provide extended shelf life comprising the steps of:

providing a strong pressure chamber having a boss formed thereon:

fitting a check valve on said boss;

soldering said check valve to said boss to provide a hermetically sealed joint;

charging said chamber with high pressure gas through said check valve whereby said check valve temporarily retains said gas within said chamber; and

soldering closed the inlet port of said check valve to provide a hermetically sealed container.

4,255,917

STRING PACKAGING MACHINE AND APPARATUS

Walter N. Stone, 18 Rundelane, Bloomfield, Conn. 06002

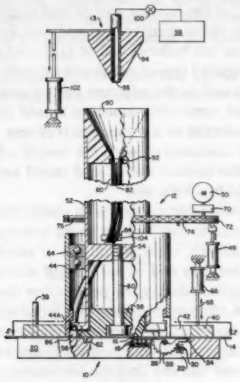
Filed Sep. 21, 1979, Ser. No. 77,852
Int. Cl.³ B65B *63/04*
U.S. Cl. 53—430 **26 Claims**

15. A method for packaging filamentary members comprising the steps of:

delivering a first end of an uncoiled member to a point juxtapositioned to a sheet of heat sealable packaging material;

coiling the member on a first surface of the sheet of heat sealable material;

shearing tabs from the sheet of heat sealable material; and



folding the sheared tabs over the coiled member to retain the member in coiled form on the sheet, the folded tabs contacting and adhering to the first surface of the sheet.

4,255,918

COLLAPSIBLE WEB APPARATUS

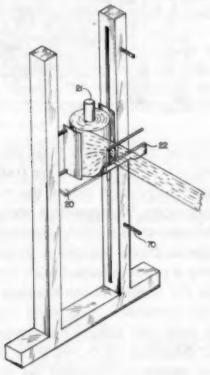
Patrick R. Lancaster, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 911,652, Jun. 1, 1978, Pat. No. 4,204,377, and Ser. No. 928,236, Jul. 26, 1978. This application Oct. 11, 1979, Ser. No. 83,610

The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.

Int. Cl.³ B65B *11/04*

U.S. Cl. 53—556 **10 Claims**



1. An apparatus for packaging a load with a cling type plastic film comprising a frame, a carriage moveably mounted on said frame, said carriage being adapted to hold a roll of stretchable film material for rotation, a turntable adapted to support a load positioned adjacent said frame, drive means connected to said turntable and adapted to rotate said turntable and an associated load mounted on said turntable to cause a web of film material to be pulled from a roll of film material held by said carriage to overwrap said load, restriction means adapted to restrict movement of the web of film material from said roll so that said material is stretched over 10% as it leaves said roll, a film width varying means mounted in the film material path so that the film web travels through said film varying means, said film width varying means comprising a substantially "U" shaped mechanism with fixed parallel legs, means to transport said mechanism into selected positions, said mechanism being adapted to be transported into at least two positions, one of said positions orienting said parallel legs transverse to the plane of the film web collapsing the film web into a roped configuration, another of said positions orienting said parallel legs substantially parallel to the plane of the film web allowing the film web to be transported through the mechanism without collapsing the film web.

4,255,919

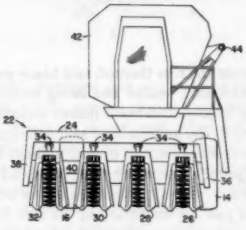
COTTON HARVESTER WITH AN OFFSET HEAD

Russell D. Copley, Ankeny; Francis E. Schlueter, Des Moines, and Mark W. Porter, Altoona, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 2, 1979, Ser. No. 54,283

Int. Cl.³ A01D *45/18*

U.S. Cl. 56—30 **7 Claims**



1. A cotton harvester for harvesting cotton planted in substantially uniformly spaced parallel rows comprising:

a main frame supported at its forward end by first and second transversely spaced drive wheels; a plurality of transversely spaced harvesting units having crop-receiving openings and carried by the frame generally forward of the wheels, the outermost unit on a first side of the harvester located substantially inside a fore-and-aft plane defined by the outside edge of the first drive wheel and the outermost unit on the opposite side located outboard of the second drive wheel, the units receiving a plurality of rows between the drive wheels and at least one row outside the second drive wheel; and cotton receiving and storage means located on the harvester including means for discharging stored cotton toward the first side of the harvester into a separate cotton-receiving implement wherein the cotton storage means is shifted toward the first side during discharging thereby shifting the center of gravity of the harvester toward that side, and wherein the unit on the outboard side of the second drive wheel tends to maintain the harvester in a balanced condition, and wherein a clear, unobstructed vertical expanse is provided in the fore-and-aft direction along the first side of the harvester for accommodating the cotton-receiving implement in close proximity thereto.

4,255,920

SUNFLOWER HARVESTER ATTACHMENT FOR COMBINES

Samuel P. Janzen, Winkler, Canada, assignor to New J Industries Ltd., Winkler, Canada

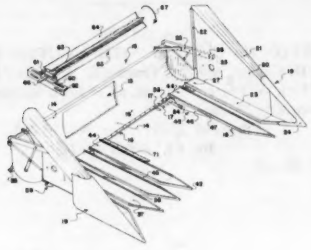
Filed Apr. 23, 1979, Ser. No. 32,540

Int. Cl.³ A01D *45/00*

U.S. Cl. 56—126 **8 Claims**

1. In a harvester which includes a header for feeding harvested crop to the interior thereof and which includes a trans-

verse reciprocating knife assembly at the front thereof; an attachment for harvesting sunflowers, said attachment comprising in combination a plurality of crop divider pans secured by the rear end thereof in spaced and parallel relationship, to the front of the header immediately above the knife assembly, a substantially vertical divider at each side of said header extending forwardly parallel to said crop divider pans and means to secure said crop divider pans to said header thereby supporting same in cantilever fashion forwardly of said header, said means including brace means secured to the underside of



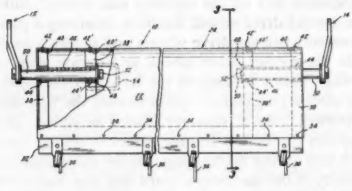
said pans adjacent the rear thereof, said brace means extending rearwardly under said header and being secured to adjacent the rear of said header, said brace means including a V-shaped portion secured to the underside of said pans and increasing in depth from the front to the rear of said V-shaped portion, a pan tail portion adjustably secured by the front end thereof to the rear end of said V-shaped portion, said pan being adjustably secured to said pan tail for adjusting the fore and aft angle of inclination of said pan and a bracket assembly secured to the rear end of said pan tail and to said header adjacent the rear side thereof.

4,255,921

BAT CONSTRUCTION FOR A HARVESTER REEL

Donald J. Kirby, Rte. #1, Vincent, Iowa 50594

Filed May 7, 1979, Ser. No. 36,502
Int. Cl.[3] A01D *57/02*
U.S. Cl. 56—220 **4 Claims**



1. A bat construction for a soybean plant harvesting machine, said machine having the usual laterally spaced rotating reel arms,

an elongated plant separating hollow spacer shield defining a relatively wide bulbous top end with opposed depending and converging sides terminating in relatively closely spaced relationship at a bottom end,

said shield being of unitary construction substantially coextensive in length with the distance between said reel arms,

respective shield support assemblies disposed at predetermined points inwardly from the respective ends of said shield,

each shield support assembly comprising:

an elongated bracket having a top end and a bottom end and disposed interiorly of said shield,

means securing the top end of said bracket to the interior of the top end of said shield,

means securing the bottom end of said bracket to the interior of the bottom end of said shield,

a bearing collar carried by said bracket and disposed axially of the bulbous end of said shield,

a sleeve secured in said collar and extending axially of said bulbous end to the adjacent end of said shield,

a stub shaft removably mounted in said sleeve and operably connected to a respective reel arm,

a bat board coextensive with the length of said shield secured to the bottom end of said shield and to the bottom end of said brackets, and

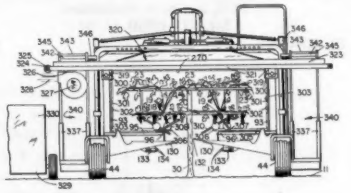
said shield swingable on said stub shafts during rotation of said reel arms so that said bat board is moved downwardly in a substantially vertical attitude to penetrate the plants with the bulbous end of said shield acting to keep such plants separated during the penetration thereof to prevent them from clinging together and from wrapping around said bat board so that when said plants are cut, they are free of entanglement with said bat board and can be effectively moved thereby into the harvesting machine.

4,255,922

APPARATUS FOR USE IN DRYING AND HARVESTING VINE BORNE CROPS AND PERFORMING OTHER WORK OPERATIONS

Kazuo Hiyama, 8184 E. Adams, and Howard K. Hiyama, 8180 E. Adams, both of Fowler, Calif. 93625

Filed Oct. 21, 1977, Ser. No. 844,147
Int. Cl.[3] A01D *46/00*
U.S. Cl. 56—330 **13 Claims**



11. An apparatus for applying fluid, to vine borne crops to facilitate drying wherein the vines are trained on trellises with the crops thereof suspended below the trellises within a substantially uniform zone, the apparatus comprising mobile frame adapted for movement in a predetermined direction of travel along the vines to carry the crops in said zone in relative movement along a predetermined path through the vehicle; a panel borne by the mobile frame beneath said predetermined path having an upwardly open fluid receptacle facing the predetermined path and sloped downwardly laterally of the predetermined direction of travel to a discharge throat; an upwardly open reservoir mounted on the frame below the throat; a perforate member borne by the frame for reciprocal movement beneath the throat of the panel and over the reservoir; means for moving the perforate member in said reciprocal movement; and a pressurized fluid system connected in receiving relation to the reservoir and having a portion disposed between the panel and said predetermined path operable to discharge fluid upwardly into the path during said movement along the vines to bathe said crops whereby fluid received on the panel flows from the throat of the panel into the reservoir through the perforate member for reuse in the fluid system and extraneous material is removed from the fluid by the perforate member.

4,255,923
PICKUP FOR STALK-CROP HARVESTER

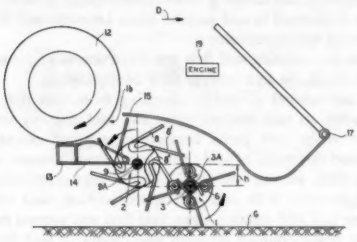
Hans-Peter Spaida; Georg Scholtissek, both of Neustadt, and Manfred Teichmann, Bischofswerda, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen, Neustadt in Sachsen, German Democratic Rep.

Filed Jun. 19, 1979, Ser. No. 49,912

Claims priority, application German Democratic Rep., Jun. 20, 1978, 206117

Int. Cl.³ A01D *43/02, 89/00*

U.S. Cl. 56—364 **10 Claims**



1. In a stalk-crop harvester having a chassis displaceable along the ground in a transport direction and supporting a transverse conveyor having a forwardly open and transversely elongated intake, a pickup comprising:

a front axle centered on a horizontal front axis transverse to said direction and forward of said intake;

a plurality of axially spaced front spring tines fixed on said front axle;

a rear axle centered on a horizontal rear axis transverse to said direction and between said front axis and said intake, said front tines having tips forming a front orbit closely juxtaposed with said rear axle;

a plurality of axially spaced rigid rear tines fixed on said rear axle and axially offset from but engageable between said spring tines of said front axle, said rear tines having tips forming a rear orbit closely juxtaposed with said front axle;

a plurality of strippers secured to said chassis at said intake and extending forwardly to between said rigid tines;

a crop holddown secured to said chassis and extending backwardly in said direction from above said front axle to above said intake; and

means for rotating said axle synchronously in the same rotational sense with forward displacement of said tines at their regions of closest approach to the ground and thereby picking crop up off the ground with said front spring tines, then transferring the picked-up crop to said rigid tines, then stripping the transferred crop from said rigid tines with said strippers and feeding it into said intake.

4,255,924
METHOD AND MACHINE FOR PRODUCING PIPE CLEANERS

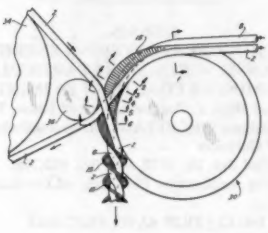
Jan Siwerstam, Munkedal, Sweden, assignor to United States Tobacco Company, Greenwich, Conn.

Filed Jul. 27, 1979, Ser. No. 61,187

Int. Cl.³ A46D *3/05;* **D02G** *3/42*

U.S. Cl. 57—24 **8 Claims**

2. Apparatus for producing rod-fiber assemblies, each of which includes two bendable rods which are twisted into interlocking spirals with fiber elements clamped at their longitudinal central portions between the rods, which incoudes, means to produce a workpiece comprising two rods which are drawn together along a predetermined path with an array or transverse fibers with their longitudinal center portions positions between and clamped by the rods, means to twist said rods into continuous interlocking spirals comprising, a pulley having an annular peripheral surface and a flange which defines a ledge surface extending radially outwardly from said peripheral surface and against which one of the rods of said assembly is pressed simultaneously in an axial direction and radially inwardly with respect to the pulley axis with the rod moving against each fiber element at one side of said central portion thereof whereby the fiber element is clamped against said ledge surface of the pulley, means for moving the other rod of said assembly tangentially away from said pulley whereby said fiber elements are held in their predetermined



parallel relationship between said one rod and said ledge surface of said pulley while moving through a predetermined arc on said pulley, means to direct said other rod tangentially toward said surface at the downstream limit of said arc and against said central portions of said fiber elements to re-form a clamping relationship with said one rod to produce a re-formed rod-fiber assembly, and means to hold said re-formed rod-fiber assembly in taut relationship and to draw it from said pulley and to twist said rod-fiber assembly at a controlled rate whereby the rods forming said re-formed rod-fiber assembly are twisted into continuous interlocking spirals within the zone where they move from said pulley.

4,255,925
SECTIONAL SCAFFOLDING FOR SPINNING, TWISTING AND LIKE FRAMES

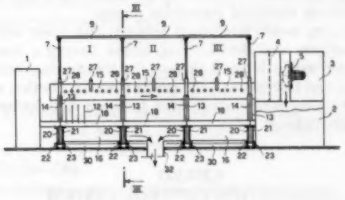
Angelo Marzoli, Palazzlo Sull'oglio, Italy, assignor to F.lli Marzoli & C. S.p.A., Italy

Filed Apr. 16, 1979, Ser. No. 30,685

Claims priority, application Italy, Apr. 24, 1978, 22685 A/78

Int. Cl.³ D01H *1/16, 11/00*

U.S. Cl. 57—304 **3 Claims**



1. Scaffolding for spinning, twisting and like frames including a plurality of longitudinally disposed modular structural sections situated between a head unit and a tail unit with a plurality of longitudinally extending structural members interconnecting each of said structural sections characterized:

(a) in that each of said structural sections comprises two shell-like parallel vertical walls spaced apart from one another with sound-dampening means disposed therebetween whereby noise level will be minimized;

(b) in that at least two of said structural members are hollow

and are situated one above the other with their centers located on the vertical central axis of said vertical walls;

(c) in that others of said structural members than said hollow structural members are situated laterally of said vertical walls, connect said vertical walls laterally thereof, and are adaptable to being laid on the ground;

(d) in that the upper one of said hollow structural members is operably connected with suction means for operation at individual processing stations, the lower one of said hollow structural members is equipped with a downwardly directed port, and said upper and lower hollow members form conduits with connection means for filtering means for use in conjunction with said suction means.

4,255,926

INSTALLATION FOR RECOVERING ENERGY FROM SOLID FOSSIL FUELS, MORE PARTICULARLY BITUMINOUS COAL HIGH IN INERTS

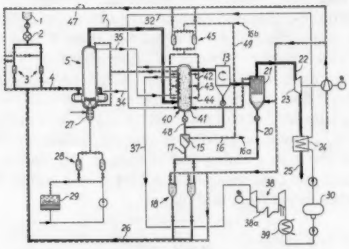
Klaus Heyn, and Hans J. Pogrzeba, both of Essen, Fed. Rep. of Germany, assignors to STEAG Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jul. 18, 1978, Ser. No. 925,708

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733029

Int. Cl.[3] **F02B** *43/08;* **F02C** *6/18*

U.S. Cl. 60—39.12 **6 Claims**



1. An installation for recovering energy from solid fossil fuels, more particularly, fuels high in inerts, and paricularly bituminous coal, said installation comprising:

at least one steam generating wet bottom boiler pressure fired with ground fuel for converting the solid fuel to combustible flue gas;

gas turbine means operable by the flue gas for driving electrical generation means;

steam turbine means operable by the steam from said boiler for driving electrical generation means;

desulfurizing means interposed between said boiler and said gas turbine, said desulfurizing means having a heat exchanger means located therein for transferring heat between said flue gas and the steam from said boiler; and

dust removing means interposed between said boiler and said gas turbine.

4,255,927

COMBUSTION CONTROL SYSTEM

Robert H. Johnson, Bolton Landing, and Colin Wilkes, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,191

Int. Cl.[2] **F02C** *9/14*

U.S. Cl. 60—39.23 **19 Claims**

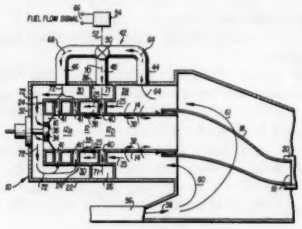
1. In a gas turbine of the type wherein at least one combustor is coupled to the discharge of the compressor and the fuel is burned with excess air or excess fuel to maintain a low temperature of combustion, said combustor having a substantially tubular configuration and including a combustion liner configured to define an elongate combustion chamber substantially centered about an axis, said combustion chamber terminating in a chamber end wall at one end thereof and including a reaction zone near said chamber end wall and a dilution zone axially spaced from said reaction zone, fuel supply means extending into said reaction zone, and a hollow casing surrounding said combustor, said casing coaxially surrounding said combustor such that said space forms an annular configuration;

a combustion control system comprising:

means for dividing the space within said casing at least into first and second space portions isolated from each other and in substantial alignment with each other in an axial direction, said dividing means comprising a plenum chamber positioned in said annular space between said first and second space portions;

means for coupling said first space portion to said compressor discharge in a reverse flow configuration;

first and second air paths extending from said first space portion to said reaction zone and said dilution zone respectively, said paths comprising conduit means positioned externally of said casing, said conduit means including first, second and third conduit legs communicating respectively with said first space portion, said reaction zone and said dilution zone, said first and second conduit legs being coupled through said casing to said first and second space portions respectively, said first leg being



shared by said first and second paths and said first path further including said second leg, and a first plurality of passages communicating between said second space portion and said combustion chamber in the vicinity of said reaction zone, said second path further including said third leg coupled through said casing to said plenum chamber, and a second plurality of passages communicating between said plenum chamber and said combustion chamber in the vicinity of said dilution zone;

means external to said casing and upstream of said combustion chamber for varying the airflow in respective ones of said paths inversely with respect to each other, said means for varying said airflow comprising valve means adapted to admit air from said first leg in variable proportions to said second and third legs respectively;

control means connected to said airflow varying means adapted to control the setting of the latter such that airflow from said first space portion into said first and second paths varies as a direct and inverse function respectively of at least one operating condition of said apparatus; and

means controlled in accordance with at lest one load-responsive operating condition for energizing said control means to determine the setting of said valve means;

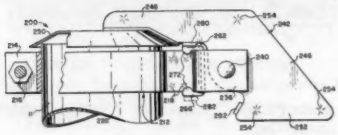
whereby said turbine is enabled to operate efficiently with a fuel-lean or fuel-rich mixture across a wide load range and with minimum emission of exhaust pollutants.

4,255,928

SWINGABLE RAIN COVER FOR VERTICAL EXHAUST PIPES WITH STOP MEANS

W. Richard Jones, North Barrington; Albert Hartman, Jr., Hampshire; Earl Conrad, Lake in the Hills, and Harry J. Kraig, Barrington Hills, all of Ill., assignors to Mercury Metal Products, Schaumburg, Ill.

Filed Dec. 11, 9178, Ser. No. 967,990
Int. Cl.[3] F01N 7/00; F23L 17/02
U.S. Cl. 60—324 10 Claims



1. A gravity actuated protective cover device adapted to be secured upon the upstanding exhaust stack of an internal combustion engine to prevent entry of extraneous matter therein during the inoperative condition of the engine and comprising:

A. a support member adapted to be secured to the exhaust stack and having a pivot structure and resilient bumper means mounted thereon, the support member having a clamping formation to straddle and be clamped to the exhaust stack which includes adjustable fastening means, said support member being formed of a pair of metal straps of generally mirror construction connected face to face, the pivot structure, bumper means and fastening means being generally aligned horizontally when the support member is installed on a stack, wherein the bumper means are disposed on said support member between the pivot structure and the fastening means,

B. a balance arm mounted on said pivot structure for rocking movement about said pivot structure in a vertical plane, the balance arm having a cover member connected to the front and thereof and a counterweight vane, the vane and cover member being on opposite sides of the pivot structure, the balance arm being adapted for said rocking movement between two positions, one of which is with the cover member disposed engaged over the end of the exhaust stack but without touching the same, the other position being with the cover member substantially rotated away from the stack,

C. the balance arm being heavier on the cover member side of the pivot than on the vane side of the pivot so that the normal condition of the balance arm is with the cover member in the first of said positions when the engine is not operating,

D. the balance arm having a pair of stop members on an edge thereof, the stop members being equally spaced from the pivot means but disposed at an angle relative to one another and said pivot means,

E. the straps having portions thereof spaced apart to provide a bifurcated portion, the pivot being located in the bifurcated portion,

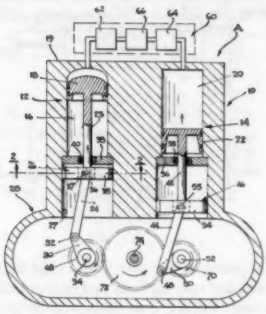
F. resilient bumper means disposed at said bifurcated portion and arranged in the path of movement of the stop members whereby to limit the said rocking movement and prevent engagement of the balance arm with any other part of the cover device on the stack end.

4,255,929

HOT GAS ENGINE WITH DUAL CRANKSHAFTS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Allan R. McDougal, La Crescenta, Calif.

Filed May 19, 1978, Ser. No. 907,431
Int. Cl.[3] F02G 1/04
U.S. Cl. 60—517 16 Claims



1. A hot gas engine comprising:

(a) an engine block,

(b) a displacer cylinder in said engine block and having central axis and with a shiftable displacer piston therein,

(c) an expander cylinder in said engine block and having central axis and with a shiftable expander piston therein,

(d) a heat exchange means connected across said displacer cylinder and expander cylinder,

(e) a crankcase on one end portion of said engine block and located so as to communicate with ends of the expander and displacer cylinders, said engine block having a dimension measured along the central axis of said cylinder which is substantially greater than the like dimension of said crankcase, said engine block not being sealed from said crankcase against substantial pressure differential,

(f) a first crankshaft in said crankcase operatively connected to said shiftable displacer piston and being rotatable therewith,

(g) a second crankshaft in said crankcase operatively connected to said shiftable expander piston and being rotatable thereby,

(h) first coupling means on said first crankshaft,

(i) second coupling means on said second crankshaft, and

(j) a power output shaft operatively coupled to one of said coupling means or one of said crankshafts and providing a power output from said hot gas engine.

4,255,930

POWER DEVICE

Adam J. Natalie, 16919 Bell St, Riverside, Calif. 92330

Filed Aug. 10, 1979, Ser. No. 65,508
Int. Cl.[3] F15B 7/08
U.S. Cl. 60—546 3 Claims

1. A hydraulic power device comprising:

an input piston and cylinder assemblage;

an output piston and cylinder assemblage;

a fluid conduit interconnecting said input and said output piston and cylinder assemblages whereby a closed hydraulic circuit is defined therebetween;

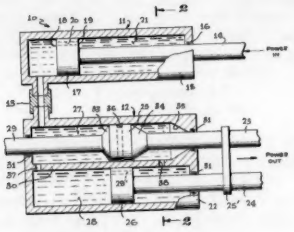
said output piston and cylinder assemblage being responsive to movement of said input piston and cylinder assemblage to amplify power produced by said input piston and cylinder assemblage;

said output piston and cylinder assemblage including a housing having a pair of chambers occupied by movable pistons respectively;

means coupling said pistons together so as to move in unison;

hydraulic fluid inter-communicating between said input piston and cylinder assemblage and said chambers via said conduit;

a selected one of said pair of pistons in said chambers is balanced between shafts slidably mounted to said housing by bearings and seals;



said selected piston of said pair is provided with frusto-conical forward and rear surfaces and said chamber includes a concave wall surface corresponding to said rear piston surface; and

said other piston of said pair of pistons includes flat parallel end faces and includes a plurality of open-ended passageways therethrough.

4,255,931

HYDRAULIC BRAKE BOOSTER FOR A VEHICULAR BRAKE SYSTEM

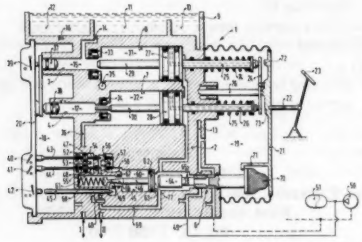
Heinz Leiber, Leimen, and Robert Mergenthaler, Heidelberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 44,885

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825132

Int. Cl.[3] **B60T** *13/00, 11/32;* **F15B** *13/10*

U.S. Cl. 60—547 A **9 Claims**



1. A hydraulic brake booster for a vehicle brake system having a control valve actuated by a brake pedal via an excursion-limiting spring and arranged to monitor both a connection between a supply source and a primary cylinder in said hydraulic brake booster, further including a primary cylinder piston and a connection between said primary cylinder and a relief point, said system further having a shut-off mechanism for said excursion-limiting spring which responds upon a failure of supply pressure, further wherein said shut-off mechanism includes a piston member movable in accordance with motion of the control valve and to which piston member a motion pulse can be imparted in the area of its normal position.

4,255,932

TANDEM MASTER CYLINDER

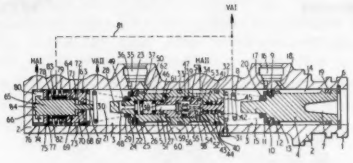
Peter Riedel, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 16, 1979, Ser. No. 39,638

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830223

Int. Cl.[3] **B60T** *11/20*

U.S. Cl. 60—562 **21 Claims**



1. A tandem master cylinder for a vehicle hydraulic brake system comprising:

a first pressure piston;

a second pressure piston in line with and spaced from said first pressure piston;

a first pressure chamber disposed between the adjacent ends of said first and second pressure pistons and coupled to a front wheel brake of one of two brake circuits;

a second pressure chamber bounded by an end of said second pressure piston remote from said first pressure piston and coupled to a front wheel brake of the other of said two brake circuits;

a first regulator controlling pressure communication between said first pressure chamber and a rear wheel brake of said one of said two brake circuits, said first regulator having a first stepped piston loaded by a first control spring and a first valve;

a second regulator controlling pressure communication between said second pressure chamber and a rear wheel brake of said other of said two brake circuits, said second regulator having a second stepped piston loaded by a second control spring and a second valve; and

means which, in the event of failure of either one of said one and said other of said two brake circuits, one of said first and second valves in the other of said two brake circuits is actuated mechanically by one of said first and second pressure pistons to thereby keep said one of said first and second valves in an open position.

4,255,933

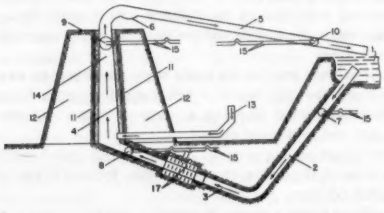
GEOTHERMAL POWER PRODUCING LOOP

Wayne Bailey, R.D. #2, Schaghticoke, N.Y. 12154, and Richard Cattell, R.D. #3, Ballston Spa, N.Y. 12020

Filed Jun. 19, 1978, Ser. No. 917,095

Int. Cl.[3] **F03G** *7/04*

U.S. Cl. 60—641 **3 Claims**



1. In a geothermal power producing loop, a continuous source of water, a tube taking this water down into the earth, another tube meeting said first tube at its lowest extremity to pick up hot water geothermally heated and bring it to the

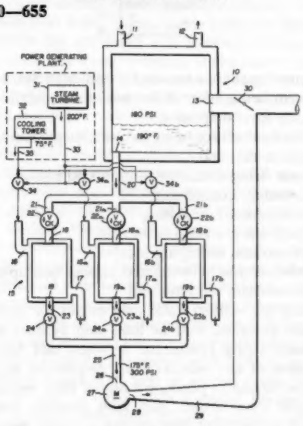
earth's surface as steam, a chimney to receive such steam and carry it upward as a chimney draft, said chimney draft supplemented by a draft of air entering said chimney sidewise near its base through a second chimney, a a steam condenser connected to the top of said first chimney turning said steam to water, and means for returning said water to said continuous water source, a hydro power plant near the top of said first named tube, a steam turbine near the upper portion of said second named tube filled with steam, an air turbine within the top interior of said first chimney, a water turbine near the lowest point in said means for carrying condensate back to said continuous water source, and electric power generating means rotatively connected to each of said turbines, and a common electric power line electrically connected to each of said electric power generating means.

4,255,934

CLOSED LOOP POWER SYSTEM

Roger B. Stephenson, Pompano Beach, Fla., assignor to John T. Bender, Jr., Delray Beach, Fla., a part interest

Filed Feb. 13, 1980, Ser. No. 121,103
Int. Cl.³ F01K *23/04*
U.S. Cl. 60—655 **6 Claims**



1. A closed loop power system for use with a source of hot fluid and a source of cooling fluid, said system comprising:

a first heat exchanger having a container for holding a working fluid in a liquid state at elevated temperature and pressure;

a second heat exchanger having a container for holding the working fluid;

means for passing the working fluid from said container in the first heat exchanger in a liquid state at elevated temperature and pressure to said container in the second heat exchanger;

means for supplying said cooling fluid from said source thereof to said second heat exchanger to cool the working fluid therein;

means operable thereafter to supply hot fluid from said source thereof to said second heat exchanger to heat the working fluid therein in a liquid state to a pressure substantially higher than its pressure in the first heat exchanger;

a fluid motor having an inlet and an outlet;

means for passing the heated working fluid in a liquid state from said second heat exchanger to the inlet of said fluid motor to drive the latter;

means for passing the working fluid from the outlet of said fluid motor to said container in the first heat exchanger;

and means for cooling the working fluid in said first heat exchanger to said elevated temperature and pressure;

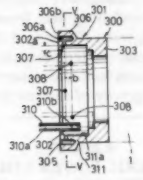
said second heat exchanger being positioned below said first heat exchanger to receive the working fluid therefrom by gravity flow.

4,255,935

LIQUID ATOMIZING DEVICE

Teru Morishita, Shizuoka, Japan, assignor to Toyoto Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 23, 1978, Ser. No. 953,879
Claims priority, application Japan, Mar. 20, 1978, 53/32736
Int. Cl.³ F02C *7/22*
U.S. Cl. 60—745 **5 Claims**



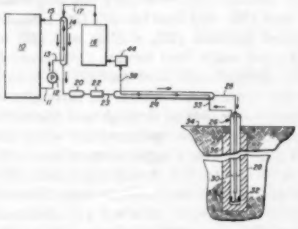
1. A liquid atomizing device comprising a sleeve-shaped body provided with an inner cylinder having a cylindrical inner peripheral surface and an outer cylinder fitted to the front end of the inner cylinder and having a cylindrical inner peripheral surface concentric with said inner peripheral surface of the inner cylinder and a nozzle injecting a liquid against the inner peripheral surface of the inner cylinder, in which said sleeve-shaped body may be secured to a rotational shaft at the rear end thereof concentrically therewith, both of said inner peripheral surfaces of the inner and outer cylinders having a smooth finish thereon and the inner peripheral surface of the outer cylinder having a diameter larger than that of the inner cylinder, and an annular channel opening forward is provided between front ends of the inner and the outer cylinders.

4,255,936

HEAT PUMP WATER HEATER

Robert W. Cochran, P. O. Box 368, Lakeland, Fla. 33802

Filed Oct. 20, 1978, Ser. No. 953,038
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.7 **16 Claims**



1. A system for heating a fluid stored within a container comprising:

a. a compressor for compressing and heating a fluorocarbon refrigerant;

b. a heat exchanger coupled with said container and said compressor for transferring heat between the fluid and the refrigerant;

c. means for circulating the fluid through said heat exchanger to transfer heat from the refrigerant through said heat exchanger to the fluid to thereby cool and condense the refrigerant from a gas to a liquid; and

d. a coaxial earth tap having an input coupled to said heat

exchanger, an output coupled to said compressor, and upper and lower ends, including:

i. an inner passageway for transferring liquid refrigerant from the upper end to the lower end of said earth tap

ii. restricting means coupled to the lower end of the inner passageway of said earth tap for maintaining the refrigerant within said inner passageway in a liquid state and for vaporizing the refrigerant as it is discharged from the lower end of the inner passageway, wherein the vaporized refrigerant discharged from the restricting means is in contact with the inner surface of the outer wall of the coaxial earth tap that is located below ground level;

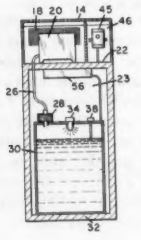
iii. an outer coaxial passageway thermally coupled with a heat source for transferring heat from said heat source to vaporize the refrigerant discharged from said restricting means and to increase the temperature of the refrigerant as the refrigerant travels from the lower end to the upper end of the outer passageway of said earth tap.

4,255,937

ATMOSPHERIC WATER COLLECTOR

Richard Ehrlich, 175 NW. 121 St., North Miami, Fla. 33138

Filed Nov. 22, 1978, Ser. No. 962,876
Int. Cl.³ F25D *23/00, 21/14*
U.S. Cl. 62—264 **1 Claim**



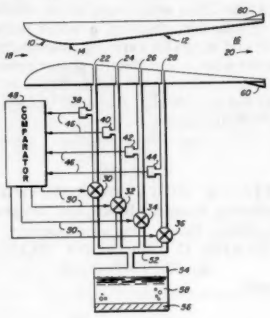
1. An atmospheric water collector comprising a cabinet (**10**), said cabinet having an upper compartment (**12**) and a separate lower compartment (**23**), a horizontal partition (**22**) between said upper and said lower compartments, a dehumidifier (**20**) located in said upper compartment (**23**) and a water collecting and storing tank (**30**) located in said lower compartment (**23**), a water feed conduit (**26**) connecting said dehumidifier (**20**) to said water tank (**30**), said feed conduit (**26**) extending through said horizontal partition (**22**), a filter unit (**28**) in said feed conduit (**26**), said water feed conduit (**26**) conducting its collected water through said filter unit (**28**), a water discharge conduit (**40**) connecting said water tank through a water pump (**42**) and check valve (**44**) up through said horizontal partition (**22**) to a combination discharge spout and water pump control switch (**48**) outside of said upper compartment (**12**), a water tank water level control (**38**) in said water tank (**30**) connected to said dehumidifier (**20**) to deactivate said dehumidifier when the water level in said water tank is at a predetermined height, and an ultra-violet water sterilizing lamp (**34**) in said water tank above said predetermined water level height, a filter (**45**) on said water discharge conduit (**40**) in a separate compartment (**46**) above said horizontal partition, said dehumidifier compartment (**12**) having oppositely located perforated walls (**16**, **18**) permitting air circulation through said upper compartment (**12**) about said dehumidifier, a refrigerator apparatus including a refrigerator unit (**52**), a condenser (**54**) and an evaporator (**56**), all located to cool said lower compartment (**23**), said cabinet having a verticle door (**24**) and door opening providing one verticle wall of said lower compartment (**23**) and a horizontal cover (**41**) and horizontal opening at the top of said upper compartment (**12**), thereby providing ready access to all units of said water collector.

4,255,938

WATER BOILER/VENTURI COOLER

Dean E. Norris, and John R. Welling, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 19, 1979, Ser. No. 21,642
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—268 **5 Claims**



1. An improvement in a system for cooling a heat source, the cooling system being adapted for use in a liquid flow stream, the cooling system comprising:

a boiler, the heat source being in heat energy communication with said boiler; and

a refrigerant being contained within said boiler;

the improvement comprising:

a venturi further comprising:

an upstream converging section;

a downstream diverging section;

a throat section between and joining said upstream and downstream sections; and

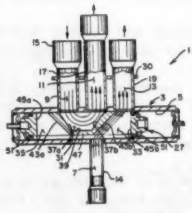
at least one venturi static inlet means for producing an inlet pressure, said at least one venturi statis inlet means being connected between said boiler and a region of said venturi being responsive to the liquid flow stream to produce a higher flow velocity of the liquid flow stream, said inlet pressure being lower than an ambient free stream pressure responsive to said higher flow velocity.

4,255,939

FOUR WAY REVERSING VALVE

Sam A. Ou, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 21, 1979, Ser. No. 41,014
Int. Cl.³ F25B *13/00*
U.S. Cl. 62—324 A **13 Claims**



1. In a reversing valve for a heat pump system or the like, said heat pump system including a first coil, a second coil, said first and second coils being operatively connected to one another, and a compressor having a suction inlet for drawing low pressure refrigerant from one of said coils, and a discharge

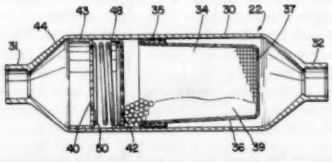
outlet for supplying refrigerant at high pressure to the other of said coils, said reversing valve being adapted to be connected in said heat pump system and being selectively operable in either a first position for supplying high pressure refrigerant to said first coil and for receiving low pressure refrigerant from said second coil or a second operative position for supplying high pressure refrigerant to said second coil and for receiving low pressure refrigerant from said first coil, said valve having a body with a bore therein, said body having a plurality of ports therethrough in communication with said bore including a high pressure inlet port adapted to be connected to the discharge outlet of said compressor, a low pressure outlet port adapted to be connected to the suction inlet of said compressor, a first inlet/outlet port adapted to be connected to said first coil, and a second inlet/outlet port adapted to be connected to said second coil, said valve further including a slide sealably, slidably movable in said bore between a first position in which said reversing valve is in its first operative position and a second position in which said reversing valve is in its second operative position, said slide having a flow switching cavity therein in communication with said low pressure outlet port and with said second inlet/outlet port when said slide is in its first position and in communication with said low pressure outlet port and with said first inlet/outlet port when said slide is in its second position for receiving low pressure refrigerant from one of said coils and for directing it to the suction side of the compressor, wherein the improvement comprises: said slide having a one-piece slide body with said flow switching cavity therein, said one-piece slide body further having a first flow passage on one side of said cavity extending straight through said slide body without obstruction therein for communication between said high pressure inlet port and said first inlet/outlet port when said slide is in one of its stated positions and a second flow passage in said slide body on the side of said cavity extending straight through said slide without obstruction therein for communication between said high pressure inlet port and said second inlet/outlet port when said slide is in its other position, said slide having a pair of inclined walls angling inwardly toward one another and toward the cavity bottom with the outer ends of the inclined surfaces defining a cavity mouth of such size that said low pressure outlet port and one of said inlet/outlet ports are in register with said cavity when the slide member is in either its first or second position, with the inner faces of said inclined walls forming the ends of said cavity, and with the outer faces of said inclined walls forming the inner ends of said flow passages, so that fluid flowing through the cavity is smoothly deflected by said inner faces of said inclined walls so as to enter the low pressure outlet port with a minimum loss of momentum or flow energy and so that the fluid discharged from said high pressure outlet port is diverted by said outer faces of said inclined walls to a selected inlet/outlet port with a minimum loss of flow energy.

4,255,940

DISCHARGE LINE FILTER-DRYER

Darwin R. Grahl, and Walter O. Krause, both of Newark, N.Y., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 9, 1979, Ser. No. 65,016
Int. Cl.[3] F25B *27/00*
U.S. Cl. 62—324.3 **12 Claims**



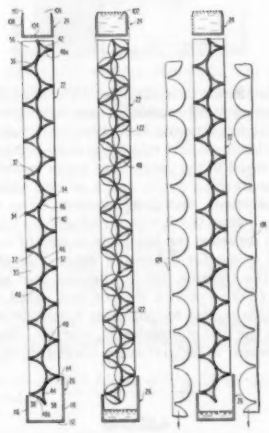
1. A refrigerating system, comprising compressor means having a discharge outlet for delivery of pressurized fluid to the system, condenser means for cooling the pressurized fluid to a liquid state, expansion and evaporator means for converting the liquid back to the gaseous state for return to said compressor means, and a dryer connected between the discharge outlet of said compressor means and said condenser means, said dryer having molecular sieve as the desiccant material therein, said dryer being directly connected to said discharge outlet of said compressor means and having means for supporting said molecular desiccant material in the path of flow of pressurized fluid from said compressor means so that substantially all of said pressurized fluid flows over said desiccant material.

4,255,941

ICE MAKING MACHINE AND METHOD

Jose B. Bouloy, 519 S.E. Euclid Lane, Port St. Lucie, Fla. 33452

Filed Dec. 5, 1979, Ser. No. 100,412
Int. Cl.[3] F25C *1/04*
U.S. Cl. 62—347 **9 Claims**



1. An ice machine evaporator unit comprising:

a first series of ice-forming molds, each mold of the series being substantially a semi-cylinder, said molds having their longitudinal axis parallel to one another and being joined tangentially at the lip thereof to adjacent molds with the joined lips lying in a plane,

a second series of ice-forming molds structured similarly to said first series,

said first and second series of molds being assembled in back-to-back tangential contact forming therebetween a cascade of fluid conduits of approximately triangular cross-section, the longitudinal axis of said conduits being substantially parallel to the longitudinal axis of said ice-forming molds,

conduit means at the ends of said fluid conduits joining said fluid conduits for seriatim flow of fluid there through,

weir means at one end of said assembly of first and second molds for flowing water over the exposed surfaces of said ice-forming molds, and

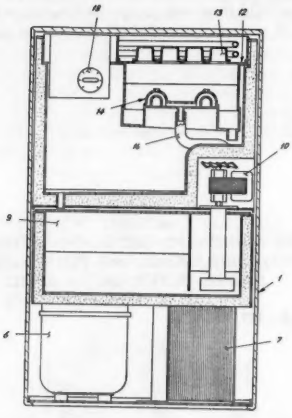
collector means at the end of said assembly opposite to said weir means for receiving water discharged from said ice-forming molds.

4,255,942

AUTOMATIC SELF-CONTAINED ICE CUBE MACHINE

Emanuele Lanzani, Milan, Italy, assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Jan. 11, 1979, Ser. No. 2,718
Claims priority, application Italy, Feb. 2, 1978, 19904 A/78
Int. Cl.[2] F25C *1/04*
U.S. Cl. 62—348 **6 Claims**



1. An automatic ice cube machine, to be used particularly in homes, offices or small establishments, having means to provide successive freezing and harvesting cycles and comprising a water tank having a first relatively small compartment having capacity equal to the quantity of water needed for at least one complete freezing cycle; and a second relatively larger supply compartment, said compartments being continuously interconnected near the bottoms thereof so that the larger compartment serves as the source of supply of water; a freezing unit; and means for delivering water from the first compartment to the freezing unit to thereby cool said delivered water and to freeze a portion thereof; and means providing for the return of the cooled but unfrozen remainder of said delivered water to the first compartment, whereby the water in the first compartment is progressively cooled during successive cycles.

4,255,943

HOLDING STRUCTURE FOR A DRIVE SHAFT IN A VEHICLE OF REAR WHEEL INDEPENDENT SUSPENSION TYPE

Katsuyuki Kobayashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 860,305, Dec. 14, 1977, abandoned.
This application Jul. 19, 1979, Ser. No. 58,774
Claims priority, application Japan, Dec. 14, 1976, 51-168736
Int. Cl.[3] F16D *3/34*
U.S. Cl. 64—21 **2 Claims**

1. A holding structure for a drive shaft used in a rear-wheel drive vehicle of the rear wheel independent suspension type to transmit power from a differential gear to a driven rear wheel, said structure comprising:

a first constant velocity universal joint of fixed type on one end of said drive shaft adjacent said differential gear and remote from said wheel, said first constant velocity universal joint comprising:

an outer ring having a spherical inner periphery;

an inner ring having a spherical outer periphery, said inner ring being within the outer ring;

a plurality of first balls;

a ring-shaped cage for holding the first balls between the inner and outer rings, said cage being between the inner and outer rings and having spherical inner and outer peripheries;

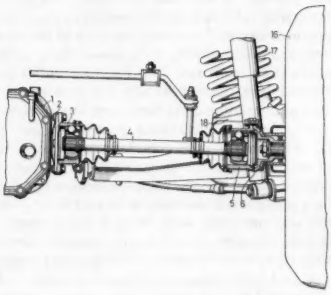
the spherical outer periphery of the inner ring is in surface contact with the inner periphery of the cage; and

the spherical inner periphery of the outer ring is in surface contact with the outer periphery of the cage; and

a second constant velocity universal joint of slidable type on the other end of said drive shaft adjacent said wheel and remote from said differential gear, said second velocity universal joint comprising:

a second outer ring having a flat inner periphery;

a second inner ring having a spherical outer periphery, said second inner ring being within the second outer ring;



a plurality of second balls;

a second ring-shaped cage for holding the second balls, said cage having spherical inner and outer peripheries, said second cage being between the second inner and outer rings;

means for retaining the second inner ring within the second outer ring; and

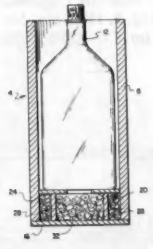
the outer and inner peripheries of the second cage are respectively in contact with the inner periphery of the second outer ring and the outer periphery of the second inner ring to support the second inner ring in the interior of the second inner ring.

4,255,944

SERVER FOR WINE BOTTLES AND THE LIKE

James H. Gardner, and Noel H. de Nevers, both of Salt Lake City, Utah, assignors to Oros Company, Salt Lake City, Utah

Filed Jul. 30, 1979, Ser. No. 61,655
Int. Cl.[3] F25D *3/08*
U.S. Cl. 62—457 **5 Claims**



1. A server for wine bottles and the like comprising

a housing open at the top for receiving a bottle and having side wall shaped to conform to and surround the side exterior of the bottle and a bottom wall joined at its perim-

eter to said side wall, said side wall having a height of at least substantially the same as the height of the enlarged portion of the bottle and being made of a heat conductive material, the side wall and bottom wall forming a receptacle means for holding ice in contact with said side wall to cause said side wall to absorb heat from the bottle if the bottle is at a higher temperature than the side wall, and to substantially prevent the transfer of ambient heat to the bottle, and

support means within said housing above said bottom wall to hold the bottle above and out of contact with the ice, said support means having openings therein to allow placement of ice into the receptacle means through the top opening of the housing.

4,255,945

TRIPOD HOMOKINETIC JOINTS WHICH HAVE AXIAL RETAINING MEANS

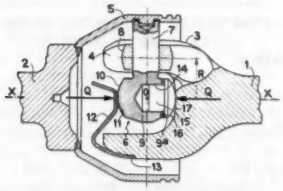
Orain M. Alexandre, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Mar. 12, 1979, Ser. No. 19,619

Claims priority, application France, Mar. 22, 1978, 78 08331

Int. Cl.³ F16D *3/30*

U.S. Cl. 64—21 **4 Claims**



1. A tripod homokinetic joint comprising a member in the form of a tripod for connection to one of two shafts to be interconnected and defining three trunnions, part-spherical rollers respectively rotatably and slidably mounted on the trunnions, a second member termes a tulip member for connection to the other of said two shafts and defining raceways in which the rollers are respectively mounted, means defining bearing surfaces carried by the tulip member, an axial retaining device comprising means defining two part-spherical surfaces carried by the tripod and bearing against the adjacent bearing surfaces carried by the tulip member, the bearing surfaces carried by the tulip member having in centre zones thereof recesses of concave shape having radii of curvature which are slightly larger than radii of curvature of the part-spherical surfaces carried by the tripod.

4,255,946

TORQUE OVERLOAD SENSING DEVICE

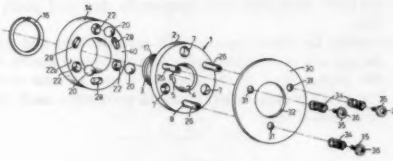
Quinten A. Hansen, Hwy. 38, Franksville, Wis. 53126

Filed Mar. 30, 1979, Ser. No. 25,360

Int. Cl.³ F16D *3/16, 7/00, 43/20*

U.S. Cl. 64—29 **4 Claims**

1. A torque overload sensing device comprising, a body secured to a rotatable member, a rotor mounted adjacent said body for driving rotation therewith; ball and detent means between said body and said rotor and including a plurality of axially shiftable balls mounted on said body, an axially alignable detent on said rotor for each of said balls, said detents being formed with a sharp corner adjacent said balls and for engagement therewith and which prevent said balls from bottoming in said detents, said balls being resiliently urged into said detents but forced therefrom by excessive torque on said device; stud means between said body and rotor and including studs rigidly fixed on said body and extending therefrom in both axial directions, circumferentially arcuate recesses in said rotor and into which said studs extend for limited relative rotation therein, said recesses having circumferential end portions engagable by their respective studs for providing a driving connection between said rotor and said body when said balls have been forced from their respective detents, switch



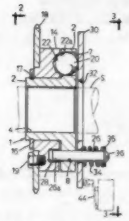


plate means axially shiftable on said studs, and spring means carried by said studs and bearing against said switch plate for providing axial compressive force on said balls and urging said plate into contact with said balls and consequently urging said balls into their respective detents.

4,255,947

WARP KNITTING MACHINE WITH WEFT INSERTION APPARATUS

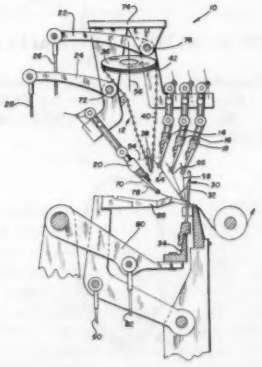
Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textil-Maschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,439

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2736977

Int. Cl.³ D04B *23/06, 23/10, 23/08, 23/12*

U.S. Cl. 66—84 A **4 Claims**



1. A weft inserting apparatus for use with a warp knitting machine having a needle bed, a plurality of guide bar drive levers with guide bars affixed thereon, and push rods operatively connected thereto, comprises in combination:

(a) thread provider means for supplying a plurality of weft threads;

(b) thread transfer means for carrying each of said weft threads across the width of said knitting machine proximate said needle bed, said thread transfer means being disposed substantially within the space bounded by said needle bed, said push rods, said guide bar drive levers, and between forwardly and rearwardly disposed guide bars; and

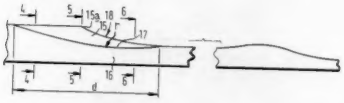
(c) means for removing said weft threads from said transfer means and positioning them proximate said needle bar at the proper time of the knitting cycle, at least one said removing means being disposed proximate each end of said needle bed.

4,255,948

STRESS REDUCING LATCH NEEDLE SHANK

Norman T. Sanders, Caersws, Wales, assignor to Needle Industries Limited, Studley, England

Filed Apr. 26, 1978, Ser. No. 899,900
Int. Cl.³ D04B *35/04*
U.S. Cl. 66—123 **18 Claims**



1. A latch needle comprising an elongate shank portion of generally flat strip-like form defining a general longitudinal axis and having side faces and upper and lower edge faces, a hook portion at a forward end of the shank portion and having an open mouth, a latch element, pivot means for mounting the latch element on the shank portion for movement between closed and open positions with respect to the mouth of the hook portion, and a butt portion spaced rearwardly along the shank portion from the hook portion, wherein the shank portion of the needle includes a part between said butt portion and said pivot means over which said shank portion is reduced in thickness over part only of its depth to define an integral web or section which is asymmetrical with respect to a median plane parallel to said side faces and a median plane parallel to said edge faces, the depth of the web or section and of the remainder of said part being such as to define a progressive reduction of transverse cross-sectional area along said part from its rearward towards its forward end.

4,255,949

ATHLETIC SOCKS WITH INTEGRALLY KNIT ARCH CUSHION

James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677

Filed Aug. 16, 1979, Ser. No. 66,914
Int. Cl.³ A41B *11/02;* **D04B** *9/46*
U.S. Cl. 66—185 **7 Claims**

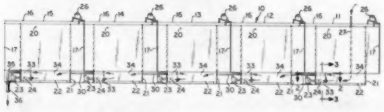
1. A knit athletic sock for providing additional cushioning in the inner arch area of a wearer's foot and particularly adapted for wear with athletic shoes having arch supports which fail to provide sufficient support and cushioning to prevent discomfort to the wearer's arch during participation in vigorous athletic activities such as jogging and running, said sock comprisinng a lower sole including an arch area in the medial portion of said sole, said arch area including inner and outer arch portions positioned on opposite sides of said sole and extending coursewise from substantially the middle wale of said sole, said inner arch portion having an integrally knit support cushion formed by a sufficiently greater amount of yarn being knit in the inner arch portion than the amount of yarn being knit in said outer arch portion to provide increased thickness in the inner arch portion which is adapted to underlie the inner arch of the wearer's foot for enhancing the support and cushioning on the inner arch area of the wearer's foot and thereby reducing the shock normally imparted to the inner arch of the wearer's foot so that normal articulation of the bones in the foot takes place during participation in vigorous athletic activities.

4,255,950

LIQUID CONTROL SYSTEM SPRAY WASHER

Gary G. Lazaroff, 1320 White Orchard La., St. Louis, Mo. 63141

Filed May 21, 1979, Ser. No. 40,490
Int. Cl.³ D06F *31/00, 39/10*
U.S. Cl. 68—18 F **1 Claim**



1. A spray washing system for garments including a plurality of spray stations for spraying garments passing through the spray stations, comprising:

(a) a liquid tank for each spray station,

(b) a filter located within each tank to provide a liquid-filtered compartment and a liquid-unfiltered compartment, said filter extending substantially across the path of liquid passing between said compartments,

(c) a pump for each spray station including an intake located in the liquid-filtered compartment of the associated tank,

(d) means for introducing liquid into the tank of one spray station,

(e) means interconnecting the liquid-unfiltered compartment of the tank of the said one spray station with the tank of a second spray station for feeding liquid from the tank of the said one spray station to the tank of the second spray station,

(f) the interconnecting means including an overflow pipe interconnecting the liquid-unfiltered compartments of the tanks of the said one and second spray stations, the overflow pipe providing for the flow of liquid regardless of any blocking of the filters and lowering of liquid levels in the liquid-filtered compartments,

(g) the overflow pipe bridging the liquid-unfiltered compartment of the tank of the said one spray station,

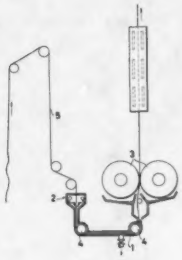
(h) a generally vertical, substantially imperforate wall located within each tank, the wall and the filter cooperating to divide the tank into the liquid-filtered compartment and the liquid-unfiltered compartment, and

(i) the overflow pipe being connected to the liquid-unfiltered compartment of the tank of said second spray station through said wall of said one spray station.

4,255,951
DEVICE FOR CONTINUOUSLY IMPREGNATING CLOTH MATERIAL WITH LIQUID

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co. Ltd., Wakayama, Japan

Filed Nov. 8, 1979, Ser. No. 92,541
Claims priority, application Japan, Nov. 13, 1978, 53-139731
Int. Cl.³ D06B 3/18
U.S. Cl. 68—22 R **1 Claim**



1. A device for continuously impregnating a cloth material with a liquid, said device comprising:

a tubular cloth material passage measuring at least 400 mm in length, said passage being provided with an opening which is slightly wider than the breadth of the cloth material to be processed in transverse width and measures about 3 mm in longitudinal width, said passage having a cloth material inlet and a cloth material outlet;

a liquid supply mechanism adjoining the cloth material inlet of said cloth material passage including a liquid reservoir in communication with said cloth material passage;

wringer rolls provided in the vicinity of the cloth material outlet of said cloth material passage; and

a pair of weir plates disposed within said liquid reservoir in said liquid supply mechanism, each of said weir plates being arranged on an opposite side of said cloth material passing through said liquid reservoir, said weir plates forming a gap therebetween through which said cloth material passes on its way to said passage, and means for adjusting said weir plates relative to one another for varying said gap between said weir plates.

4,255,952
WASHING MACHINE TRANSMISSION

Roger N. Johnson, Hagaman, N.Y., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 10, 1979, Ser. No. 83,435
Int. Cl.³ D06F 37/40
U.S. Cl. 68—23.7 **10 Claims**

1. A transmission for coupling a rotary input drive selectively to first and second driven loads, the transmission comprising:

a rotatable input shaft;

gearing means driven by said input shaft and including an output member;

a rotatable gear case mounting said gearing means;

a transmission housing enclosing said gear case and said gearing means;

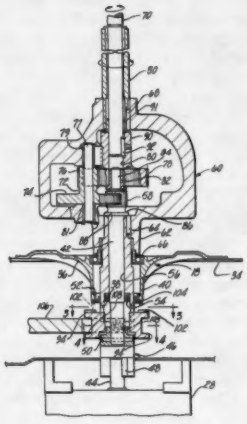
first means extending from said housing for connecting said output member to the first of the driven loads;

second means extending from said housing for connecting said gear case to the second of the driven loads;

said input shaft extending from said housing for connection to the rotary input drive so that the first load is driven from the input drive through said gearing means;

a tubular member connected to said gear case and protruding from said housing about said input shaft;

clutch brake means including a clutch brake coupling member movable between first and second axial shifted positions relative to the protruding portion of said tubular member; said coupling member being effective in its first axial position to cause said gear case to be braked against

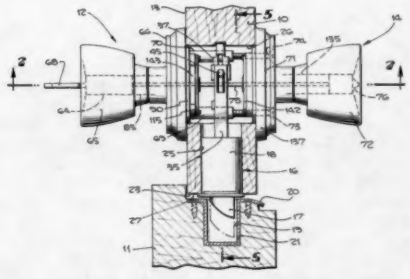


rotation and in its second axial position to cause said gear case to be drivenly connected to the rotary input drive so that said second load is driven from said input drive through said gear case only when said coupling member is in its second axial shifted position.

4,255,953
COMBINATION SPRING/DEAD BOLT LOCK

Hagen Dietrich, Delta, and William J. Fane, North Vancouver, both of Canada, assignors to Norris Industries, Inc., Long Beach, Calif.

Filed May 2, 1979, Ser. No. 35,208
Int. Cl.³ E05B 55/00
U.S. Cl. 70—107 **18 Claims**



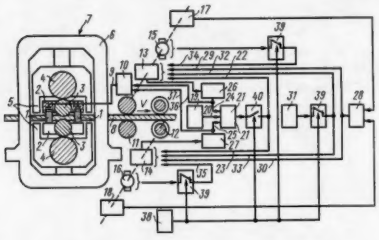
1. A door lock acting as a combination spring latch and dead bolt comprising a latch bolt subassembly with a cam engaging means thereon and adapted to move between a partially extended spring latch position, a dead bolt position, and a withdrawn position, latch bolt actuating means comprising a spindle means and a main cam member on said spindle means having an operating engagement with said cam engaging means, a key actuated outside knob member in operating engagement with said spindle means, an inside knob member having a turn member thereon in operating engagement with said spindle means, outside driving means adapted to engage said spindle means for driving said spindle means in a rotating

direction, an outside drive housing having a transversely reciprocating path of movement and adapted to engage said outside driving means, and a cam drive between said outside knob member and said outside drive housing, an inside driving means adapted to engage said spindle means for driving said spindle means in a rotating direction, an inside drive housing having a transversely reciprocating path of movement and adapted to engage said inside drive means, and a cam drive between said inside knob member and said inside drive housing, a clear way between said outside drive housing and said outside drive means when said latch bolt subassembly is in dead bolt position whereby the outside knob member is free of operating engagement with said spindle means when the latch bolt subassembly is in dead bolt position.

4,255,954
DEVICE FOR CONTROLLING SHAPE OF STRIP OR SHEET BEING ROLLED

Alim I. Chabanov, ulitsa Uritskogo, 12, kv. 73; Valery V. Danilјuk, ulitsa Revoljutsii, 6, kv. 46, both of Novosibirsk; Vladimir I. Rusaev, prospekt Oktyabrskoi Revolutsii, 93, kv. 52, Sevastopol; Sergei N. Tropin, ulitsa Udarnayaa, 1/2, kv. 52, Novosibirsk; Petr S. Grinchuk, ulitsa 19 Partsiezda, 65, kv. 9, Kramatorsk; Viktor I. Ponomarev, ulitsa Marata, 12, kv. 63, Kramatorsk; Georgy G. Fomin, ulitsa Katirinicha, 3, kv. 22, Kramatorsk; Miro; Ivan K. Shnikov, ulitsa Pobedy, 12, kv. 57, Lipetsk; Ivan N. Bogaenko, ulitsa Sholom Aleikhema, 27, kv. 90, and Vladimir M. Pisarenko, ulitsa Demyana Bednogo, 25a, kv. 14, both of Kiev, all of U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,221
Int. Cl.[3] B21B *37/00*
U.S. Cl. 72—19 **2 Claims**



1. A device for controlling the shape of a strip or sheet being rolled at the exit from a mill stand, comprising:

at least two sets of rollers arranged in pairs at both sides of said strip and transversely thereof at the exit from said mill stand and brought in contact with preselected zones of said strip or sheet so as to correct the shape thereof in accordance with the difference in the rotational speed of said rollers and consequent difference in tension at said zones;

speed actuators for each set of said rollers, said speed actuators being geared respectively to each set of rollers intended for tensioning said strip or sheet and having control inputs;

a means for regulating the tension of said strip or sheet, having inputs and outputs, said tension regulating means having one group of said inputs connected to said speed actuators from which electric signals representative of a predetermined initial tension of the strip or sheet are applied thereto, said output of said tension regulating means being electrically connected to control inputs of said speed actuators;

a means for setting the tension of said strip or sheet, said means having an output electrically connected to an input of said tension regulating means;

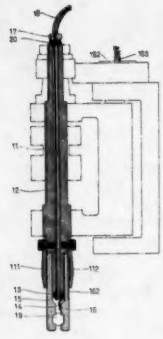
a comparator having inputs and an output, said comparator being connected to said control inputs of said speed actuators;

sensor means for sensing angular positions of said of said rollers, one for each set of rollers, said sensor means having outputs connected to said inputs of said comparator.

4,255,955
AUTOMATIC SAFETY MECHANISM FOR FORMING MACHINES

Shi C. Lee, Kaoshiung, Taiwan, assignor to Chunzu Machinery Industry Co., Ltd., Kaoshiung, Taiwan

Filed Mar. 9, 1979, Ser. No. 19,264
Int. Cl.[3] B21D *53/24, 43/10;* **B21C** *51/00*
U.S. Cl. 72—31 **4 Claims**



1. A multiphase forming machine having a clamp means including at least a pair of legs for grasping a workpiece during certain operating phases of the machine and a rotatable conveyor means for rotating and retaining said clamp means, an automatic safety mechanism for connection to a control circuit of the machine, said automatic safety mechanism comprising:

(a) means for electrically isolating one of said pair of legs from the other leg and from said conveyor means;

(b) an electrically conductive rod disposed inwardly of said conveyor means and in electrical isolation therefrom;

(c) a contact positioned on an end of said rod in electrical contact with said rod and said one of said pair of legs; and

(d) a flexible electrically conductive member attached to the other end of said rod,

wherein an electrical circuit is completed when an electrically conductive workpiece is grasped by said clamp means, said circuit including, in series, said machine, said conveyor means, said other of said legs, the grasped workpiece, said one of said legs, said contact, said rod and said flexible member, said electrical circuit being connected to said control circuit for sensing the pressure and nonpressure of said workpiece in said clamp means.

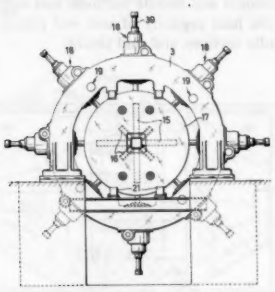
4,255,956
ROLLING MILL SIZING APPARATUS

Theodor Zacharias, Meerbusch, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Co., Dusseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1979, Ser. No. 32,864
Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821888
Int. Cl.[3] B21B *13/10*
U.S. Cl. 72—225 **10 Claims**

1. Apparatus for sizing metal ingots of polygonal cross section comprising a housing, a plurality of spaced non-driven sizing rolls in said housing, disposed so that one such sizing roll is provided for each corner edge of an ingot to be rolled, fixed in the direction of ingot displacement, a plurality of spaced

non-driven guide rolls in said housing disposed to engage the ingot in the region of the central circumferential portions of its outer surfaces and thereby guide the ingot between the sizing rolls, adjustment means for radially adjusting said guide rollers towards and away from the longitudinal axis of said ingot, said



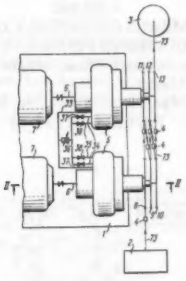
sizing rollers and guide rollers being located in substantially the same cross sectional plane of the housing, adjustment means on the housing for coarse radial adjustment of the sizing rollers towards and away from the longitudinal axis of the ingot and positioning means on the housing for fine radial adjustment of the adjustment means on the sizing rollers.

4,255,957

MACHINE FOR MULTIDIE NONSLIP DRAWING OF WIRE PRODUCTS

Vadim A. Davydov, ulitsa Mikhailova, 29, korpus 3, kv. 57; Vladimir I. Khromov, Leninsky prospekt, 26, kv. 34; Aizik M. Kogos, ulitsa Fedora Poletaeva, 24, korpus 2, kv. 50, all of Moscow; Leonid I. Rymarenko, prospekt Lenina, 10a, kv. 28, Balashikha Moskovskoi oblasti; Igor M. Makeev, Frunzenskaya naberezhnaya, 36, kv. 227, and Nikolai V. Pasechnik, prospekt Mira, 188, kv. 60, both of Moscow, all of U.S.S.R.

Filed Nov. 16, 1978, Ser. No. 961,392
Int. Cl.³ B21C *1/04*
U.S. Cl. 72—279 **6 Claims**



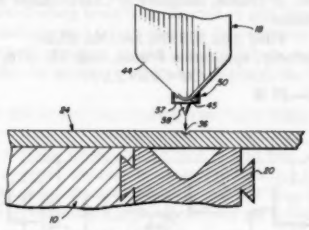
1. A machine for multidie nonslip drawing of wire products, comprising: a bed; a decoiling device placed upstream of said bed along the flow of the production process; a coiling device downstream of said bed along the flow of the production process; die-head blocks with dies mounted on said bed; at least one pair of hydrodynamic transmissions, each of the transmissions being a multiturbine hydraulic transformer secured on said bed; each of said transformers housing a plurality of coaxial shafts, each of said shafts mounted in bearings located between said shafts, the external bearings being mounted in the housing of said multiturbine hydraulic transformer; draw blocks grouped in units, the number thereof corresponding to that of the multiturbine hydraulic transformers, each of said draw blocks being secured on a respective one of said shafts and being placed coaxially one with respect to another in each unit; turbine wheels, the number thereof corresponding to that of the draw blocks in a unit, each wheel being secured individually on a respective of said shafts of the multiturbine hydraulic transformer; a drive motor geared to said multiturbine hydraulic transformer.

4,255,958

METHOD AND APPARATUS FOR PRECISION LOCATING OF A WORKPIECE IN A PRESS BRAKE

Thomas J. Strong, 2219 W. Vineyard, Tempe, Ariz. 85282

Filed Aug. 1, 1979, Ser. No. 62,702
Int. Cl.³ B21D *7/06, 11/22*
U.S. Cl. 72—389 **12 Claims**



1. A male die assembly for use in a press brake machine of the type employed in forming flat stock workpieces, said male die assembly comprising:

(a) a plurality of male die segments of various lengths which are multiples of each other;

(b) means for alignigly interconnecting selected ones of said plurality of male die segments in a side-by-side relationship to assemble the male die assembly in a desired multiple length; and

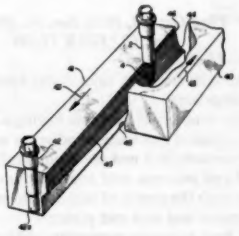
(c) at least a pair of locator male die segments which are assembled in spaced apart locations within the male die assembly when said plurality of male die segments are assembled in side-by-side relationship to form the male die assembly, each of said locator male die segments being for registeringly engaging the workpieces formable in the press brake machine to correct workpiece misalignment.

4,255,959

DIES FOR MAKING THREAD-FORMING SCREW WITH STEP TAPER

Herman G. Muenchinger, South Dartmouth, Mass., assignor to Research Engineering & Manufacturing, Inc., New Bedford, Mass.

Division of Ser. No. 902,098, May 5, 1978, Pat. No. 4,194,430. This application Jun. 7, 1979, Ser. No. 46,211
Int. Cl.³ B21H *3/06*
U.S. Cl. 72—469 **8 Claims**



1. A roll-threading die for producing a screw on a screw blank, said die comprising a first series of ridges with first

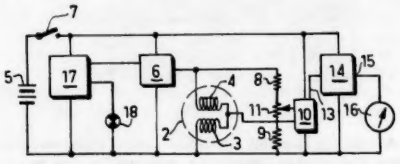
valleys therebetween of uniform depth, the bases of said valleys defining a plane, the spacing between said ridges being the pitch of the screw thread, a second series of ridges providing valleys therebetween of varying depth, said depth varying from about ¾ of the depth of said first valleys to about ½ of the depth of said first valleys, and a third series of ridges providing valleys therebetween of varying depth, the bases of said last-mentioned valleys defining an additional plane that forms with said first-mentioned plane an angle of about 20° to 30°.

4,255,960

APPARATUS FOR MEASURING AND/OR MONITORING A CONSTITUENT OF AN ATMOSPHERE

Maurice Boutonnat, Gouvieux, and Gérard Rose, Villers St-Paul, both of France, assignors to Charbonnages de France, Paris, France

Filed Aug. 9, 1979, Ser. No. 65,204
Claims priority, application France, Aug. 25, 1978, 78 24663
Int. Cl.³ G01N *25/18*
U.S. Cl. 73—27 R **9 Claims**



1. An apparatus for measuring and/or monitoring the amount of a constituent of an atmosphere comprising a measuring cell having a porous wall for communicating the interior of the cell with said atmosphere, an element having an electrical property which varies in proportion to the amount of said constituent disposed in said measuring cell, an electrical supply circuit for connection to said element, and an electrical measuring circuit for connection to said element, said measuring circuit being arranged to produce an output signal the value of which is proportional to the electrical property of said element and hence to the amount of said constituent, the apparatus further comprising a storage device for storing the value of the output signal, a display device for displaying the stored value, and a triggerable time base including means for sequentially triggering the following operations; connection of said element to the measuring circuit after a predetermined delay, and storage in the storage device of the last value of the output signal.

4,255,961

DIFFERENTIAL CALORIMETER BASED ON THE HEAT LEAK PRINCIPLE

Rodney L. Biltonen; Donald B. Mountcastle, both of Charlottesville, Va., and Jaak Suurkuust, Lund, Sweden, assignors to University of Va. Alumni Patents Foundation, Charlottesville, Va.

Filed Oct. 17, 1978, Ser. No. 952,155
Int. Cl.³ G01K *17/00*
U.S. Cl. 73—15 B **25 Claims**

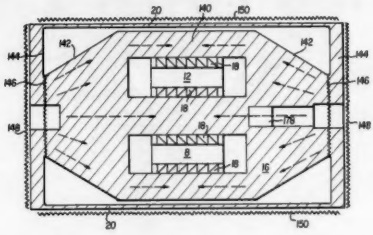
1. A differential scanning calorimeter based on the heat leak principle comprising:

a thermally conductive heat sink having a cylindrical middle section, conical end sections adjacent to both ends of said middle section, and end plates integrally attached to said conical end sections, said heat sink having a longitudinal axis through the center of said middle section, said conical end sections and said end plates;

a pair of heat capacity measuring cells symmetrically disposed within said middle section of said heat sink, one of said measuring cells containing a reference substance, and the other of said cells containing a sample substance;

a cylindrical isothermal shield attached to said end plates and surrounding said heat sink;

temperature scanning means attached to the end plates and the conical end sections of said heat sink and to said isothermal shield for adding an amount of heat to said end plates, conical and middle sections, and shield in proportion to the heat capacity of said end plates, said conical and middle sections and said shield;



temperature monitoring means for measuring the temperature of said heat sink at various points in time during a temperature scan; and

adiabatic shield means surrounding said isothermal shield for preventing heat loss or gain from said heat sink and said isothermal shield;

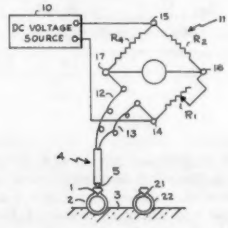
whereby said temperature scanning means uniformly heats said heat sink such that any thermal gradients within said middle section of said heat sink are essentially constrained parallel to said longitudinal axis of said heat sink.

4,255,962

METHOD AND MEANS OF RAPIDLY DISTINGUISHING A SIMULATED DIAMOND FROM NATURAL DIAMOND

Leland E. Ashman, Belmont, Mass., assignor to Ceres Corporation, Waltham, Mass.

Filed Apr. 10, 1978, Ser. No. 885,502
Int. Cl.³ G01N *25/18*
U.S. Cl. 73—15 A **26 Claims**



1. A method of distinguishing a simulated gem from a natural gem comprising the steps of:

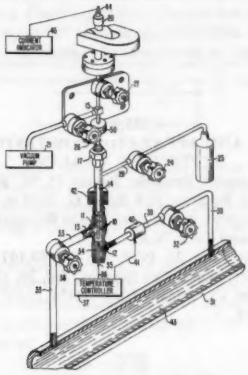
subjecting the gem to a change in heat flow from a heat flow element in a probe through a probe tip; and

measuring the change in temperature of the probe within a few seconds after subjecting the gem to the change in heat flow as an indication of the thermal conductivity of the gem.

4,255,963
HYDROGEN METER FOR LIQUID LITHIUM

Michael G. Down, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 13, 1979, Ser. No. 11,831
Int. Cl.³ G01N *7/10*
U.S. Cl. 73—19 **4 Claims**



1. Apparatus for measuring the hydrogen present in a lithium/hydrogen solution, comprising,

a housing including an opening which permits the lithium/-hydrogen solution to enter the housing,

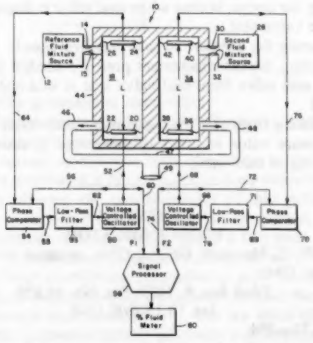
a diffusion member being a metal selected from the group consisting of niobium and vanadium and secured within said housing such that said metal is directly contacted by the lithium/hydrogen solution, the hydrogen in the lithium/hydrogen solution diffusing through said diffusion membrane, and

an ion pump means connected to said housing to develop a current in response to the diffusion of hydrogen, said current being indicative of the content of hydrogen in the lithium/hydrogen solution.

4,255,964
FLUID MONITOR

Rodney Morison, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 30, 1978, Ser. No. 965,369
Int. Cl.³ G01N *29/02*; G06F *7/64*
U.S. Cl. 73—24 **6 Claims**



1. A fluid monitor for monitoring the percent composition of a fluid mixture, said monitor comprising:

a first acoustic chamber having a measurable resonant frequency and containing a reference fluid of known percent composition;

a second acoustic chamber having a measurable resonant frequency and containing a fluid mixture of unknown percent composition;

means for measuring the resonant frequency of said acoustic chambers, said measuring means including;

a first phase locked loop comprising said first acoustic chamber coupled between a voltage controlled oscillator and a phase comparator, said phase comparator being coupled to said voltage controlled oscillator;

a second phase locked loop comprising said second acoustic chamber coupled between a voltage controlled oscillator and a phase comparator, said phase comparator being coupled to said voltage controlled oscillator;

a first transmitting transducer located in said first chamber for sending sound waves through the reference fluid;

a second transmitting transducer located in said second chamber for sending sound waves through the fluid mixture;

said first and second transmitting transducer being driven by a signal from said voltage controlled oscillator;

a first receiving transducer located in said first chamber a predetermined distance from said transmitting transducer for accepting the sound waves and for converting the sound waves into a signal indicative of the reference fluid; and

a second receiving transducer located in said second chamber a predetermined distance from said second transmitting transducer for accepting the sound waves and for converting the sound eaves into a signal indicative of the fluid mixture; and

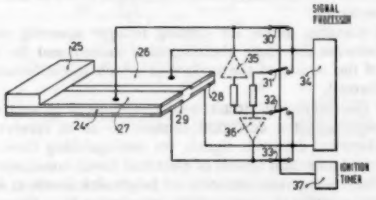
means for comparing the two resonant frequencies, said comparing means including;

signal processor means coupled to said first and second phase locked loops for comparing the resonant frequency of the reference fluid in said first acoustic chamber with the resonant frequency of the fluid mixture in said second acoustic chamber and determining the percent composition of the fluid mixture.

4,255,965
APPARATUS FOR DETECTING OSCILLATIONS OCCURRING DURING ENGINE KNOCK

Alfred Schulz, Oberriexingen; Bernward Böning; Uwe Kiencke, both of Ludwigsburg; Heinz Theuerkauf, Brunswick; Theodor Gast, Berlin; Günter Hönig, Ditzingen, and Rudolf Nagel, Asperg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,906
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829266
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **16 Claims**



1. An engine knock detector comprising:

a piezoelectric oscillator cantilevered to a part of said engine;

a signal processor selectively connectable to said oscillator

for receiving and processing electrical signals from said oscillator during a measuring phase;

a damping circuit selectively connectable to said oscillator for damping the oscillations of said oscillator during a damping phase; and

further comprising a zero crossing detector circuit (**18**) connected to said oscillator (**11**) for detecting the zero crossing of the output signal from said oscillator (**11**) and for thereafter applying a voltage of opposite polarity to the electrodes (**14, 15**) of said oscillator (**11**).

4,255,966

HARDNESS TESTING APPARATUS

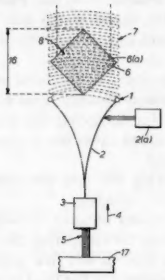
John N. Batie, Gateshead; Graham T. Relf, Newcastle-upon-Tyne, and Geoffrey A. Wilkin, Northumberland, all of England, assignors to Vickers Limited, London, England

Division of Ser. No. 961,605, Nov. 17, 1978. This application Nov. 30, 1979, Ser. No. 98,865

Claims priority, application United Kingdom, May 30, 1978, 49235/78

Int. Cl.[3] **G01N** *3/48*

U.S. Cl. 73—81 **9 Claims**



1. Hardness testing apparatus, for use in assessing dimensions of an indentation formed under controlled conditions in a region of a surface of a specimen whose hardness is to be tested, from which dimensions a hardness value for the specimen can be derived, the apparatus comprising:

(a) imaging means for illuminating the region of the surface of the specimen in which the indentation is formed and for forming an image of that region in an image plane of the apparatus, in such a manner that areas of the image formed in the image plane that are within the image of the indentation differ in brightness from areas of the image formed in the image plane that are outside the image of the indentation;

(b) a single photosensitive element arranged at the image plane for sensing brightness levels at image areas distributed over the image formed in the image plane and operable to deliver electrical detection signals having electrical levels representative of the brightness levels at the image areas;

(c) scanning means for causing relative scanning motion between the single photosensitive element and the image of the region of the surface in which the indentation is formed;

(d) discrimination circuit means, connected to said single photosensitive detection element so as to receive said electrical detection signals, for distinguishing those electrical detection signals of electrical levels consistent with their being representative of brightness levels at image areas within the image of the indentation from those electrical detection signals of electrical levels consistent with their being representative of brightness levels at image areas outside the image of the indentation, and for providing discrimination signals of a first level when the received electrical detection signals are of a level consistent with their being representative of brightness at image areas within the image of the indentation, and of a second level when the received electrical detection signals are of a level consistent with their being representative of brightness at image areas outside the image of the indentation; and

(e) correlation means for receiving the discrimination signals from said discrimination circuit means and for deriving, in dependence upon the correlation of discrimination signals of the first and second levels respectively in relation to the respective different image areas of the image formed in the image plane, an assessment of dimensions of the indentation.

4,255,967

METHOD AND APPARATUS FOR TESTING THE SETTING OF A VALVE

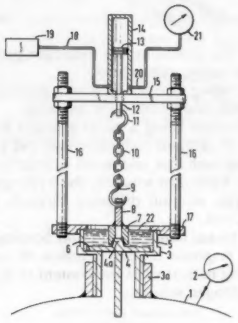
Paul A. Grymonprez, Brussels; Robert H. M. Ruyssers, Antwerp, both of Belgium, and Brian G. Barker, Grove (Near Wantage), England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 20, 1979, Ser. No. 59,197

Claims priority, application Belgium, Jul. 20, 1978, 189419

Int. Cl.[3] **F16K** *37/00;* **G01M** *13/00*

U.S. Cl. 73—168 **7 Claims**



1. A method of measuring in situ the magnitude of the pressure at which a valve is set to release from its valve seat comprising the steps of:

disengaging a biased valve from a valve seat of a pressure vessel by applying a pressure to a piston in tractive engagement with said valve to tractively lift said valve from said valve seat;

noting the instant in time when said valve is disengaged from said valve seat;

measuring the pressure in said pressure vessel;

measuring the disengagement pressure needed to tractively lift said valve from said valve seat at said instant in time; and

calculating from said disengagement and vessel pressures a pressure value in order to determine in situ the release setting of said valve.

4,255,968

FLOW INDICATOR

Joseph W. C. Harpster, Galena, Ohio, assignor to Intek, Inc., Galena, Ohio

Filed Jun. 8, 1979, Ser. No. 46,670

Int. Cl.[3] **G01F** *1/68*

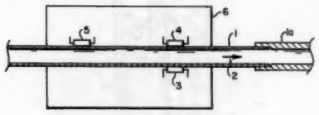
U.S. Cl. 73—204 **13 Claims**

1. Apparatus for detecting the presence and measuring the flow of material along a path comprising:

first, thermally responsive sensor means positionable adjacent said path for deriving a first output signal represent-

ing the thermal condition of said sensor means as influenced by said material flow;

heater means positionable adjacent said path and located with respect thereto to thermally influence said first thermally responsive sensor means in a manner wherein the residual temperature deriving said thermal influence varies substantially as an exponential relationship between said first sensor means and said heater means;



second, thermally responsive sensor means positioned remotely from said first thermally responsive sensor means and said heater means for deriving a second output signal representing a thermal condition of said flowing material; and

comparison means responsive to said first and second output signals for deriving a third signal corresponding with the difference therebetween, said third signal being substantially proportional to the logarithm of the rate of flow of said material.

4,255,969

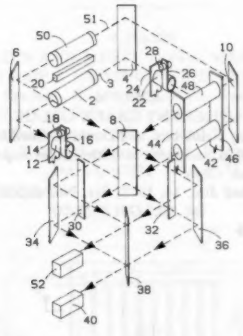
RING LASER GRAVITY GRADIOMETER

Theodore V. Lautzenhiser, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 39,410, May 15, 1979, abandoned, which is a continuation of Ser. No. 910,972, May 30, 1978, abandoned. This application Jan. 11, 1980, Ser. No. 111,420

Int. Cl.³ G01V *7/04*

U.S. Cl. 73—382 G **33 Claims**



1. A gravity gradiometer comprising:

a laser for generating a laser beam having a plurality of circular polarization modes;

first and second modulators each comprising a photoelastic element positioned in the path of said laser beam for differentially altering the characteristics of said polarization modes in response to the application of a stress, each of said modulators fixedly supported at a first end,

first and second masses connected to second ends of said first and second modulators, respectively, with the center of each mass displaced from the axis of the laser beam passing through each modulator so that the force of gravity upon the respective masses generates a differential torque about the axis of the laser beam to produce a frequency difference between said circular modes of polarization which is related to the difference in the force of gravity at the locations of said first and second masses; and

means for detecting said frequency difference.

4,255,970

BAROMETER MECHANISM

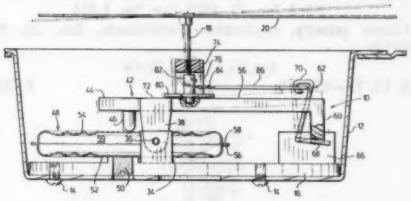
Gaston C. Van Pottelberg, R.R. #1, Palgrave, Ontario CON 1 PO, Canada

Filed Nov. 19, 1979, Ser. No. 95,745

Claims priority, application Canada, Dec. 13, 1978, 317902

Int. Cl.³ G01L *7/12*

U.S. Cl. 73—386 **9 Claims**



1. A barometer mechanism comprising, in combination, a base, a bellows having a pair of opposed co-extensive walls joined about their peripheries to form a sealed chamber and one of said walls rigidly mounted on said base whereby changes in ambient air pressure result in movement of the second wall towards and away from the mounted wall, a compound lever comprising a pair of simple levers operably contacting said movable second wall for transmitting and amplifying movement of said second wall as substantially linear motion remote from said second wall, a spindle journalled on a first of said simple levers for rotation, a helical spring concentric with and mounted on said spindle adapted to bias said spindle in a first direction of rotation, flexible connecting means secured to and wrapped about said spindle in a direction opposite to the said first direction of rotation and connected to the second of said simple levers, whereby bias of said helical spring on said spindle tensions the flexible connecting means and maintains the first of said simple levers through said second lever in continuous abutment against the movable wall of the bellows for sensing changes in ambient air pressure and transmitting changes in pressure to the spindle for rotation thereof.

4,255,971

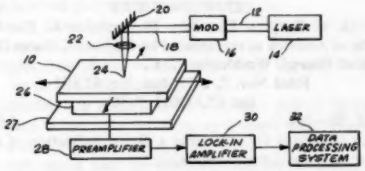
THERMOACOUSTIC MICROSCOPY

Allan Rosencwaig, 134 Timberline Ct., Danville, Calif. 94526

Filed Nov. 1, 1978, Ser. No. 956,668

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—606 **34 Claims**



1. A method of thermoacoustic or thermal wave microscopy to examine surface and subsurface properties of a material on a microscopic scale, comprising:

causing periodic localized heating at a microscopic spot in the material, to produce thermal waves which interact with microscopic features in the material to provide thermal wave imaging of the features, the thermal waves

producing acoustic waves of longer wavelength in the material which propagate through the material;

detecting the acoustic waves produced in the material, producing detector signals;

scanning the material as a two-dimensional array of microscopic spots; and

processing the detector signals.

4,255,972

DEVICE FOR THE INSPECTION OF WELDS

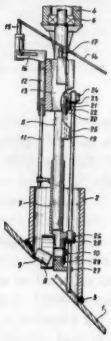
Durk Dijkstra, Zoetermeer, Netherlands, assignor to Rontgen Technische Dienst B.V., Rotterdam, Netherlands

Filed Jan. 17, 1979, Ser. No. 4,284

Claims priority, application Netherlands, Jan. 20, 1978, 7800739

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—634 **5 Claims**



1. In a device for the inspection of welds between a tubular stub and a wall, comprising a rotatably driven central shaft with a test probe, means for rotating the probe within the stub, and means for moving the probe in the axial direction of the stub; the improvement comprising means for connecting the test probe to a weld follower element which is non-rotatably connected to the shaft and is axially shiftable in respect of the shaft, means for providing translational movement of the probe axially with respect to the shaft during a revolution of the shaft to move the probe substantially parallel to the plane of the weld when the weld plane is angularly disposed at any of a number of angles with respect to the axis of the shaft, and means for maintaining the probe during rotational and translational movement at substantially the same scanning angle with respect to the weld joint.

4,255,973

DIGITAL PRESSURE TRANSDUCER FOR USE AT HIGH TEMPERATURES

Henry H. B. Karplus, Hinsdale, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1979, Ser. No. 92,154

Int. Cl.³ G01L *9/00*

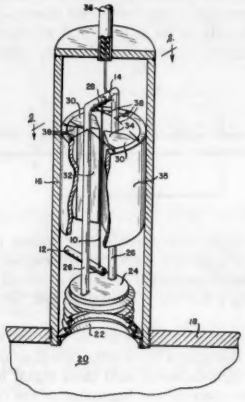
U.S. Cl. 73—704 **4 Claims**

1. An apparatus for providing a digital indication of a fluid pressure in a container comprising:

a fiber;

means for varying tension in the fiber in response to the fluid pressure;

means for exciting vibrations in the fiber at a mechanical resonant frequency of the fiber, including means for generating a magnetic field having a component perpendicular to the fiber, a coaxial cable having a center conductor connected electrically to the fiber, and a positive-feedback amplifier including a filter, said positive-feedback amplifier connected electrically to the center conductor to form with the fiber, an oscillator at a resonant frequency of the fiber, said filter connected to the center conductor of the coaxial cable for removing harmonics of the resonant



frequency of the fiber from an input to said positive feedback amplifier; and

means for counting and displaying the resonant frequency, which displayed count is a digital indication of the fluid pressure.

4,255,974

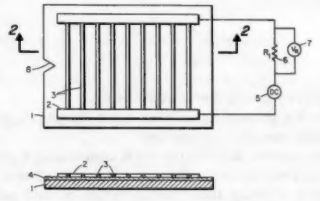
ADHERENT CRACK GAUGE

Keith F. Dufrane, Columbus, and David K. Snediker, Worthington, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jun. 14, 1979, Ser. No. 48,550

Int. Cl.³ G01B *21/00*

U.S. Cl. 73—776 **10 Claims**



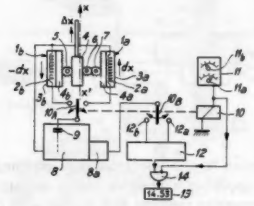
1. An improved method for crack detection in conductive substrates by the old method of securing a separate, insulated conductive element to the substrate surface and monitoring the change in an electrical property of the conductive element as a crack propagates through the substrate and severs the conductive element wherein the improvement comprises

crystallizing an adherent inorganic material on the surface of said conductive substrate to form an insulating layer, and thereafter, crystallizing an adherent conductive material on the insulating layer to form the conductive element.

4,255,975
DEVICE FOR THE PRECISE MEASUREMENT OF MOVEMENTS OR DEFORMATIONS

Pierre-Jean Debreuille, Paris, France, assignor to Coyne et Bellier, Bureau 'Ingenieurs Conseils, France

Filed May 11, 1979, Ser. No. 38,035
Claims priority, application France, Aug. 25, 1978, 78 24650
Int. Cl.[3] G01L 1/14
U.S. Cl. 73—784 28 Claims

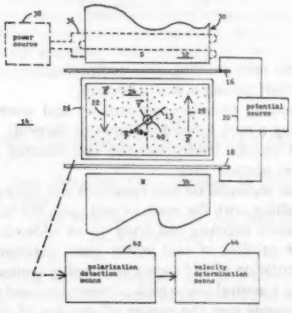


1. Device for the precise measurement of movements or deformations, comprising, in combination, at least one pair of variable reactance movement pick-ups mounted relative to each other to act as electrical transducers responsive to the same movement or deformation and arranged so that the reactances of the respective pick-ups are varied thereby by substantially equal but opposite amounts, electronic oscillation means for co-operation with said pick-ups, switching means between said pick-ups and said oscillation means for connecting the reactances of the pick-ups alternately to a corresponding point in the oscillation means whereby to alter the oscillation frequency of the oscillation means in dependence upon the different reactances of the respective pick-ups alternately and evaluation means connected to said oscillation means for deriving an output proportional to the difference of the altered frequencies of said oscillation means caused by said reactances.

4,255,976
APPARATUS AND METHOD FOR MEASURING THE VELOCITY OF A MOVING DIELECTRIC MATERIAL

Richard A. Formato, Shrewsbury, Mass., assignor to Theodore P. Zoli, Jr., Glens Falls, N.Y.

Continuation-in-part of Ser. No. 065,831, Aug. 13, 1979, abandoned. This application Sep. 17, 1979, Ser. No. 76,152
Int. Cl.[3] G01F 1/56, 3/52
U.S. Cl. 73—861.08 25 Claims



1. Apparatus for measuring the velocity of a moving dielectric material comprising:

means for establishing an electric field within the dielectric material to polarize the material;

means for establishing a magnetic field within the dielectric material to induce a velocity-dependent torque on the electric dipole moments tending to align the electric dipole moments perpendicular to both the direction of motion of the dielectric material and to the direction of the magnetic field;

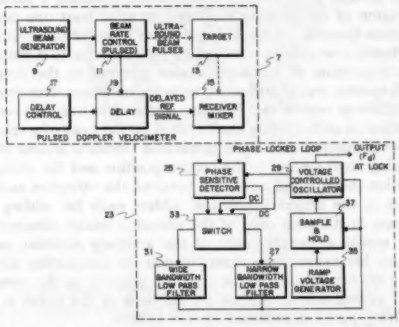
means for detecting the change in the polarization of the moving dielectric material induced by the magnetic field; and

means, responsive to the detected change in the polarization, for determining the velocity of the moving dielectric material.

4,255,977
DOUBLE REPETITION RATE DOPPLER FLOW MEASUREMENT SYSTEM

Vernon L. Newhouse, and Phung LeCong, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 30, 1978, Ser. No. 955,588
Int. Cl.[3] G01F 1/66
U.S. Cl. 73—861.25 4 Claims



1. A pulsed Doppler system for measurement of flow rates at deep internal points in a mass comprising:

pulsed Doppler output means to transmit a pulsed output signal to a target mass;

output control means adapted to vary the repetition rate of the pulsed output signal;

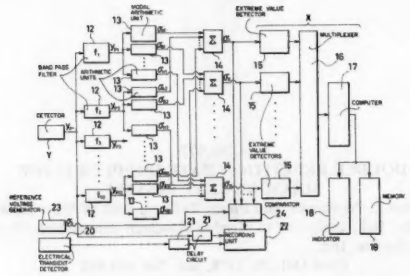
demodulating means to receive said pulsed output signal back when reflected from said target mass and providing a demodulated output signal; and

return signal analyzer means connected with said demodulating means to receive said demodulated output signal therefrom and discriminating between a false spectrum having a center frequency that is abruptly shifted because of the varied repetition rate of the Doppler output, and a true spectrum of the measured flow rate which has a center frequency that is uniformly identifiable as a measurement of the true change in flow rate of said target mass.

4,255,978
TORSIONAL VIBRATION MONITORING APPARATUS FOR A ROTATING SHAFT SYSTEM

Ichiji Shima; Tatsuo Yamamoto; Shigeru Yoshibayashi; Hiroshi Teshima, all of c/o The Kansai Electric Power Co., Inc., Technical Research Center of 2, Ichinotsubo 1-chome, Wakaoji, Amagasaki City, Osaka; Akio Hizume, 8-11, Nakamachi 1-chome, Setagaya-ku, Tokyo; Tetsuo Iki, 1998-5, Yokoo-machi, Nagasaki City, Nagasaki Prefecture; Takashi Yamamoto, 347, Motomurago, Tokitsu-cho, Nishisonogi-gun, Nagasaki Prefecture; Kyozo Kanamori, 16-10, Shiraiwa-cho, Isahaya City, Nagasaki Prefecture; Akio Shimosakoda, 37-9, and Shigeho Tanaka, 39-27, both of Hokuyo-machi, Nagasaki City, Nagasaki Prefecture, all of Japan

Filed May 4, 1979, Ser. No. 36,020
Claims priority, application Japan, May 12, 1978, 53-56316
Int. Cl.[3] G01N *3/32*
U.S. Cl. 73—577 **3 Claims**



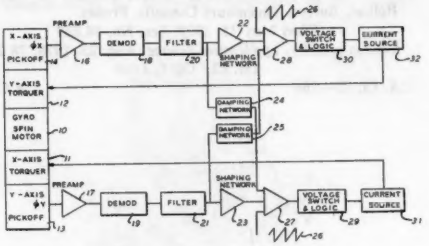
1. A torsional vibration monitoring apparatus for a rotating shaft system, comprising a detector for detecting a torsional vibration of the rotating shaft system at at least one certain position thereon, decomposing devices each for decomposing a vibration waveform obtained by said detector to a plurality of components of vibration modes inherent to the rotating shaft system, modal arithmetic units for obtaining stresses each for different ones of said vibration modes at at least one certain position on said rotating shaft system on the basis of a relation between components of the respective vibration modes of the rotating shaft system at the certain position and the arbitrary position thereon and a relation between the vibration and the stress at the arbitrary position, adders each for adding the stresses or different ones of the vibration modes obtained by said modal arithmetic units at the arbitrary position and a fatigue life expenditure counting unit for calculating the fatigue life expenditure of the arbitrary position on the rotating shaft system due to fatigue on the basis of the stress at the arbitrary position, obtained by said adders.

4,255,979
PULSE WIDTH MODULATED BINARY REBALANCE RATE CAPTURE LOOP CONTROL FOR TWO-DEGREE-OF-FREEDOM DRY TUNED GYRO

Frank S. DeCarlo, Wyckoff; Frank L. Rosen, Parsippany, and Walter J. Goetz, Wayne, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jan. 16, 1978, Ser. No. 869,898
Int. Cl.[3] G01C *19/28, 19/30*
U.S. Cl. 74—5.47 **4 Claims**

1. A two axis gyro comprising:
means for sensing gyro rotor position along a first and second axis, said sensing means also providing proportional error signals along said first and second axes when said rotor deviates from null position,
a source of ramp voltage signals,
means for electronically damping said error signals by summing said error signals with said source of ramp voltage signals whereby a pulse width modulated signal is produced whose fundamental frequency is the frequency of the forced limit cycle of said gyro, and

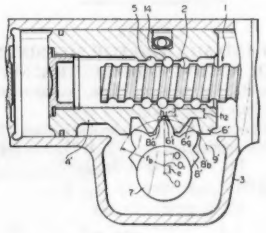


means responsive to said electronically damped signal for alternately applying a positive and a negative torquing constant current to the first and second axes of said gyro in order to reduce said error signals.

4,255,980
VARIABLE RATIO STEERING GEAR

Tokiyoshi Yanai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 6, 1978, Ser. No. 922,353
Claims priority, application Japan, Aug. 16, 1977, 52/97460
Int. Cl.[2] B62D *3/02, 3/08*
U.S. Cl. 74—388 PS **3 Claims**

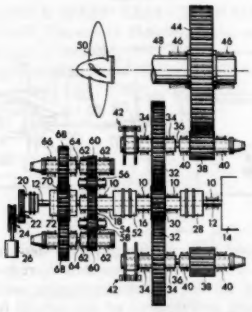


1. A variable ratio steering gear comprising:
a steering shaft having a worm portion;
a ball nut axially movably mounted on said worm portion and having a rack formed on one side thereof;
a rockshaft located transversely to said steering shaft and said worm portion; and
a sector gear mounted on said rockshaft and having tapered teeth meshing with the teeth of said rack, the tops of said tapered teeth defining and lying on an addendum curve, the tooth profiles of said sector gear, determined on a plane of rotation of said sector gear, being symmetric with respect to a neutral line which is located on said plane and which extends past the center of rotation of said sector gear and perpendicularly to the axis of said steering shaft when the steering gear is in its neutral position, in which the addendum curve of said sector gear determined on said plane is a circular arc, the center of said arc being located on said neutral line and spaced from said center of rotation in the direction of said arc, whereby the tops of said tapered teeth can be formed by turning.

4,255,981
MARINE REVERSING GEARING

Hans Sigg, Mutschellen, Switzerland, assignor to Maag Gear-Wheel & Machine Company, Limited, Zürich, Switzerland

Filed Jun. 26, 1978, Ser. No. 919,045
Claims priority, application Switzerland, Jul. 15, 1977, 8790/77
Int. Cl.³ F16H *37/06*
U.S. Cl. 74—665 A 7 Claims



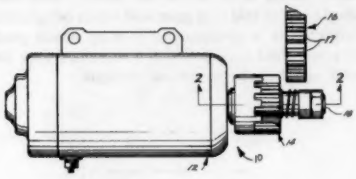
1. A marine reversing gearing comprising:
a drive shaft;
a forward clutch essentially coaxially arranged with respect to said drive shaft;
a first gearing stage comprising a pinion which can be operatively coupled by said forward clutch with said drive shaft;
the first gearing stage further comprising two essentially mutually parallel arranged gears continuously meshing with said pinion of said first gearing stage;
a second gearing stage including two gears;
a power take-off shaft drivable by means of said two gears of said second gearing stage;
a reversing gear set composed of a number of reversing gears;
at least one reverse clutch essentially coaxially arranged with respect to said drive shaft;
said reversing gear set being engageable and disengageable with the pinion of the first gearing stage by means of said at least one reverse clutch;
a slow rotating auxiliary drive having reversible direction of rotation;
a reverse movement blocking device; and
said slow rotating auxiliary drive being connected by means of said reverse movement blocking device with said drive shaft for engaging and disengaging the forward and reverse clutches.

4,255,982
STARTER ASSEMBLY UTILIZING A CASTELLATED CUP

Calvin V. Kern, Maumee, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Nov. 30, 1978, Ser. No. 965,158
Int. Cl.³ F02N *11/02*
U.S. Cl. 74—7 R 10 Claims

1. A starting motor pinion gear assembly comprising a cylindrical cup having an open end and a closed end, said closed end defining a concentrically disposed opening therethrough and said open end having a plurality of inwardly extending tangs disposed thereabout, a drive collar rotatably positioned within said cup and defining a helical splined opening therethrough, a pinion gear positioned within said cup and having teeth projecting radially outwardly from a bottom land and having inter-tooth fillets projecting radially outwardly from said bottom land at one end thereof, resilient clutch means frictionally coupling said drive collar to said pinion gear, and wherein said tangs extend inwardly between said pinion gear teeth and

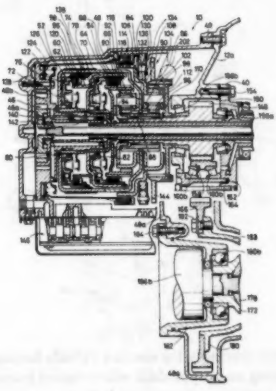


against said fillets of said pinion gear to retain said drive collar, said clutch and said one end of said pinion gear in said cup.

4,255,983
AUTOMATIC TRANSMISSION WITH GOVERNOR DRIVING ARRANGEMENT

Takahiro Yamamori, Tokyo; Kazuyoshi Iwanaga, and Kunio Ohtsuka, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 8, 1978, Ser. No. 958,766
Claims priority, application Japan, Sep. 18, 1978, 53-114944
Int. Cl.³ F16H *3/74*
U.S. Cl. 74—752 C 7 Claims



1. An automatic transmission including a torque converter, first and second planetary gear assemblies each of which has a set of planet pinions, a power input shaft drivably connecting the planetary gear assemblies to the torque converter, and a power output shaft which operatively connecting the planetary gear assemblies to a final drive unit through an output gear;
the improvement comprising:
a first flat annular disc connected at the inner periphery thereof to a driven shaft for synchronous rotation therewith;
a ring gear of said second planetary gear assembly having outer and inner surfaces bounded by first and second edge surfaces, said ring gear being fixed at said inner surface thereof to the outer periphery of said first disc at a location proximate the first edge surface of said ring gear, said ring gear having a first set of worm wheel teeth on said outer surface and a second set of teeth on said inner surface;
a second flat annular disc fixed at the inner periphery thereof to said outer surface of said ring gear proximate the sec-

ond edge surface of said ring gear, said second disc being formed with teeth at the outer periphery thereof;

and

a worm having teeth which are meshed with the worm wheel teeth of said ring gear, said worm being operatively connected to a governor valve body which produces a governor fluid pressure which increases with the rotational speed of the power output shaft.

4,255,984

PEDAL CONTROL FOR VEHICLE HAVING A CONTINUOUSLY ADJUSTABLE TRANSMISSION

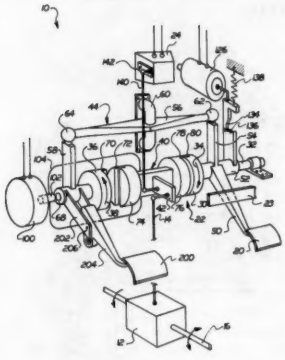
Theodor Abels, Goldregenweg 6, and Bernhard Götz, Goldregenweg 36, both of 8750 Aschaffenburg, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 26,020

Claims priority, application Fed. Rep. of Germany, May 4, 1978, 2814741

Int. Cl.³ G05G *1/14;* F16D *21/02*

U.S. Cl. 74—474 **6 Claims**



1. A control assembly for use in a vehicle having a transmission comprising an output shaft whose speed is controlled by a selector rod continuously adjustable from one extreme position through a central position to a second extreme position, the extreme positions corresponding to maximum rotational speeds of the output shaft in opposite directions, the central position corresponding to the output shaft being stopped, said control assembly comprising a pedal movable in one direction from a rest position, a switchable mechanism connecting said pedal with the selector rod, said switchable mechanism having a first condition in which motion of said pedal in said one direction causes a corresponding motion of the selector rod toward said one extreme position and a second condition in which motion of said pedal in said one direction causes a corresponding motion of the selector rod toward said second extreme position, servo means for switching said switchable mechanism from said first condition to said second condition, a selector switch for actuating said servo means to cause said switchable mechanism to change conditions and actuable at any position of said pedal, and circuit means connecting said selector switch and said servo means, said circuit means comprising safety lockout switch means for enabling said switchable mechanism to change conditions only when the selector rod is in its central position.

4,255,985

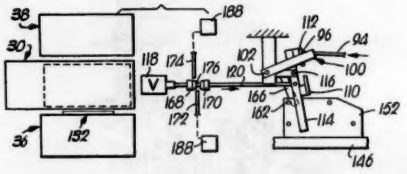
BALE-ACCUMULATING TRAILER

Thomas G. Schrag, Newton; Amos G. Hill, and Howard R. Lohrentz, both of Hesston, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 860,152, Dec. 14, 1977, Pat. No. 4,215,964. This application Aug. 17, 1979, Ser. No. 67,371

Int. Cl.³ G05G *11/00*

U.S. Cl. 74—479 **11 Claims**



1. In combination with a valve having a stem reciprocable axially to either of two opposite positions corresponding to a pair of alternative control functions, actuating mechanism for effecting alternating performance of said control functions by the valve notwithstanding a common triggering input for all of said performances, said mechanism including:

a triggering member shiftable in one direction through a predetermined displacement during each said triggering input to the valve;

a lever coupled with said stem in such a way that swinging of the lever a predetermined amount in one direction about its fulcrum moves the stem to one of said positions, while swinging a predetermined amount in the opposite direction moves the stem to the other of said positions;

each of said displacements of the member being sufficient to accomplish said predetermined amount of swinging on the part of said lever; and

means for transmitting successive said displacements of the member to the lever on alternate sides of said fulcrum.

4,255,986

DEVICE FOR ABSORBING IMPACT ENERGY

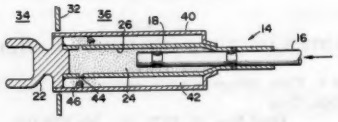
Makoto Mukoyama, Toyota, Japan, assignor to Toyota Jidosha Kogya Kabushiki Kaisha, Toyota, Japan

Filed Aug. 14, 1978, Ser. No. 933,520

Claims priority, application Japan, Aug. 15, 1977, 52/109213[U]

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—492 **5 Claims**



1. A device for absorbing impact energy comprising:

a shaft assembly which comprises a tubular member and rod-like member coupled to the tubular member such that the shaft assembly can contract;

at least one outer jacket made of hard material provided around the outside of said shaft assembly;

an energy absorbing material made of silicone rubber provided in the interior of said tubular member; and

at least one orifice provided in said tubular member which

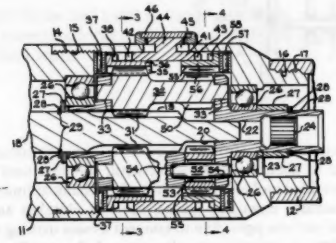
connects the interior of said outer jacket only with the interior of said tubular member whereby an impact energy is applied to said shaft assembly, the impact absorbing material is compressed and flows through the orifice and is contained in a receiving chamber formed between said outer jacket and shaft assembly, and the impact energy is absorbed.

4,255,987

REVERSIBLE SPEED REDUCTION MECHANISM

Donald A. Ciolli, University Heights, Ohio, assignor to Rotor Tool Company, Cleveland, Ohio

Filed May 10, 1978, Ser. No. 904,610
Int. Cl.³ F16H *5/10, 57/10*
U.S. Cl. 74—768 **9 Claims**



1. A reversible speed reduction mechanism for use with power tools comprising an input shaft having gear teeth, a carrier concentrically disposed about said input shaft and defining an output structure, a housing disposed about said shaft and said carrier, bearing means for rotatably mounting said shaft and said carrier within said housing, a first gear cage disposed concentrically about said input shaft gear teeth, a first pair of idler gears each mounted for rotation about an axis in said carrier in meshed engagement with said input shaft gear teeth and said first gear cage, a second pair of idler gears each mounted for rotation about one of said axes and connected to one of said first idler gears for rotation therewith, a second gear cage disposed concentrically about said carrier, a third pair of idler gears in meshed engagement with said second pair of idler gears and said second gear cage, brake means for selectively coupling said first cage to said housing in a first position and coupling said second cage to said housing in a second position, said brake means comprising an axially translatable annulus having means disposed about its ends for selectively, alternately engaging and releasing said first and said second gear cages whereby the rotational direction of said output structure may be selected by the selective alternate locking and releasing of said gear cages.

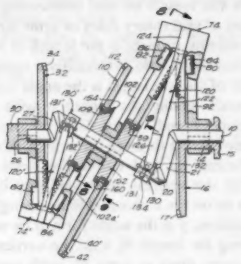
4,255,988

AXIAL GEAR TRAINS

Philip E. Massie, 4220 Irving Pl., Culver City, Calif. 90230

Continuation of Ser. No. 358,973, May 10, 1973, abandoned.
This application Apr. 17, 1975, Ser. No. 568,928
Int. Cl.³ F16H *1/28*
U.S. Cl. 74—800 **4 Claims**

1. In an axial gear train of the type having a first fixed bevel gear member provided with a first fixed gear face, a second bevel gear member having at least one gear face in mesh with said first gear face and means mounting the second gear member for nutation about the axis of the first gear member, said means including a shaft rotatable about said axis, an offset part fixed to said shaft and having a skew axle fixed thereon extending oblique to said axis and upon which said second gear member is rotatable, the improvement comprising; said second gear member having a central opening therethrough of a size to pass said shaft, offset part and skew axle therethrough, and a plurality of complementary separate parts removably mounted in said opening with each part partially embracing said skew axle



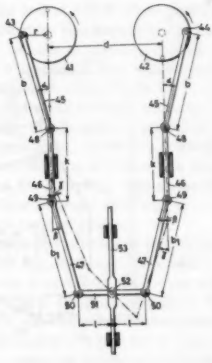
and together defining a hub journalling said second gear member on said skew axle.

4,255,989

CONVERTING ROTARY MOTION INTO VARIABLE-AMPLITUDE RECIPROCATION

Dino Dinelli, Via Miralago 3 - Albano Laziale, Rome, Italy

Filed Dec. 22, 1978, Ser. No. 972,344
Claims priority, application Italy, Jan. 6, 1978, 19057 A/78; May 12, 1978, 23335 A/78
Int. Cl.³ F16H *35/08;* **F01B** *31/14*
U.S. Cl. 74—831 **8 Claims**



1. A mechanism for transferring the drive from a rotary shaft to a variable-stroke reciprocable member which provides for the variable-amplitude reciprocation of the movable member while annulling the minimal amplitude thereof, comprising:

two discs or arms which are rotated at the same frequency;

a pin on each disc or arm equally spaced apart from the centers thereof;

two sets of three connecting rods connected pairwise by pivotal pins wherein one of the outer rods of each set is connected to one of said pins on said disc or arm, and wherein the intermediate connecting rod of each set is positioned so as to be bound to a reciprical motion along the vertical axis passing through the center of rotation of said disc or arm;

a rocker having ends which are pivotally connected by pins to the other of said outer rods of said rod sets and a center which is connected by a pin to the variable-stroke reciprocable member, and wherein

the geometrical dimensions of the mechanism are selected in accordance with the following relationship to annul the minimal amplitude:

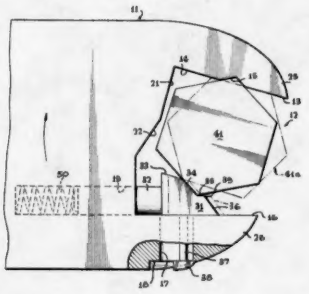
$$b \cos \alpha + b_1 \cos \beta = b + b_1 \cos \gamma$$

wherein b is the length of said connecting rods which unite said pins of said rotary discs or arms with said intermediate connecting rods, b_1 is the length of said connecting rods which unite said intermediate connecting rods with said pins of said rocker, α is the angle formed by said connecting rods having the length b with the vertical when said pins of said rotary discs or arms lie on the horizontal line passing through the centers of rotation, β is the angle formed by said connecting rods having the length b_1 with the vertical when said pins of the rotary discs or arms lie on the horizontal line passing through the centers of rotation, γ is the angle formed by said connecting rods having the length b_1 with the vertical when said pins of the rotary discs or arms are with one on the top point and with the other on the bottom point of their circular path.

4,255,990
RATCHET-ACTION END WRENCH WITHOUT RATCHET

Obe O. Doan, 25577 Old Course Way, Valencia, Calif. 91355

Filed Jul. 16, 1979, Ser. No. 57,735
Int. Cl.[3] B25B *13/12*
U.S. Cl. 81—179 4 Claims



1. An open end wrench, for use in rotating a nut or bolt head having a plurality of flats of which the adjacent flats intersect in vertices, comprising:

a body terminating in a pair of converging fixed jaws, a first one of said jaws having a first planar face for engaging any one of said flats, said first face being provided with a first notch for engaging a first one of said vertices;

a cross-face on the said body extending between said jaws and limiting the movement of said nut or bolt head within said jaws, a portion of said cross-face being cut away to provide a fulcrum for rotation of an adjacent one of said flats within said jaws;

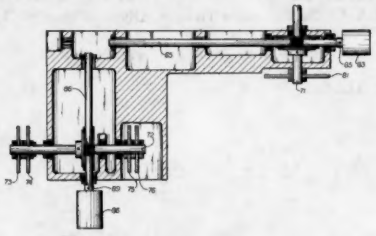
an anvil reciprocably mounted to the second of said jaws for limited motion thereon and spaced from said first face to accommodate such nut or bolt head therebetween, said anvil defining a second planar face parallel to said first planar face, and also defining a second notch for engaging the vertex opposite said first vertex when said first vertex is in engagement with said first notch; and

resilient means mounted between said anvil and said body, urging said anvil in the direction away from said body.

4,255,991
METHOD AND APPARATUS FOR ELECTROMECHANICALLY RETRO-FITTING A CONVENTIONAL AUTOMATIC SCREW MACHINE TO ACCEPT NUMERICAL CONTROL

Robert D. Lambert, 20317-244th Ave. SE., Maple Valley, Wash. 98038

Filed May 4, 1979, Ser. No. 36,043
Int. Cl.[3] B23B *3/00*
U.S. Cl. 82—1 C 13 Claims



1. A method for retro-fitting a conventional automatic screw machine to accept numerical control, wherein said conventional machine includes a plurality of mechanical timing means which actuate engaging means, such as clutches and gears, which in turn are operative to connect a main driving means to a plurality of operating mechanisms of the machine, one of which controls the spindle speed, another of which controls the indexing of the turret and still another of which controls the feeding of the stock in the spindle, and wherein said conventional machine further includes a plurality of special purpose cam means which are also driven by the main driving means, for controlling the movement of the turret and the cross-slides of the machine, wherein each machining task performed by the conventional machine requires a new plurality of special purpose cam means designed particularly for the task, wherein the method comprises the steps of:

(a) replacing the existing mechanical timing means for each operating mechanism in the conventional machine with means for actuating the engaging means associated therewith by an electrical signal, without modification of the existing engaging means;

(b) disconnecting the turret and the cross slides from the main driving means and from the special purpose cam means, so that the turret and the cross slides are actuatable without said drive means and said cam means; and

(c) connecting indivudally electrically actuatable drive means, respectively, to the turret and the cross slides, without modification of the turret and the cross sides, so that the turret and the cross slides are driven by said electrically controlled drive means instead of by said main driving means and said special purpose cam means, thereby eliminating the special purpose cam means otherwise necessary for the operation of the conventional machine.

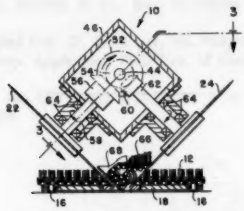
4,255,992
CARPET CUTTING METHOD

Milton M. Bolles, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 932,949, Aug. 11, 1978. This application May 21, 1979, Ser. No. 40,970
Int. Cl.[3] B26D *3/02*
U.S. Cl. 83—23 2 Claims

1. The method of providing a plurality of carpet pieces from a wide width of carpet comprising the steps of: supplying a wide width of carpet to be cut, guiding the carpet to be cut onto the support plate of a portable cutting machine into position adjacent a pair of cutting blades mounted at an angle to each other and moving the support plate and the cutting blades

forward to cut a small section of the carpet from the wide width of carpet while guiding the small section cut from the carpet in a direction away from the direction of movement of



the support blade and cutting blades to provide two smaller pieces of carpet with the edges thereof cut at an angle to the plane of the carpet.

4,255,993

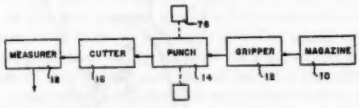
ANGLE IRON CUTTING

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Division of Ser. No. 846,216, Oct. 27, 1977, Pat. No. 4,170,910, which is a division of Ser. No. 795,088, May 9, 1977, Pat. No. 4,106,380. This application Jul. 3, 1979, Ser. No. 54,415

Int. Cl.[3] B26D *7/00;* **B23D** *23/00*

U.S. Cl. 83—71 **1 Claim**



1. Apparatus for automatic punching and cutting of angle irons or the like comprising:

means for providing a supply of angle irons to be cut;

means for transporting said angle irons away from said supply means;

means for punching holes of predetermined size in an angle iron at a punching position;

means for automatically determining the length of angle iron to be cut at a cutting position; and

means for cutting an angle iron at the cutting position to provide an angle iron of predetermined length, said cutting means comprising: a crankshaft having in-line bushings supporting it for rotation; means for rotation said crankshaft; at least one cutting blade operatively connected to said crankshaft, at a portion thereof offset from a line between the bushings, for generally linear movement in response to rotation of said crankshaft; guide means for guiding the linear movement of said blade; a common cutter housing with distinct means for cutting at least two differently-shaped angle irons; means for moving said cutter housing so that one or the other of said distinct cutting means is brought into play; at least two cutting blades operatively mounted to said crankshaft to effect angle iron cutting; and guide means for guiding the movement of said cutting blades during cutting movement thereof.

4,255,994

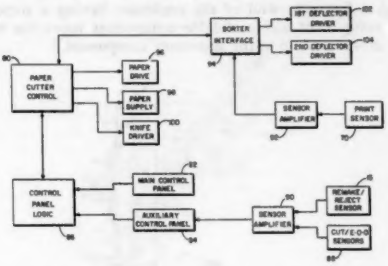
PHOTOGRAPHIC PRINT SORTER WITH SENSOR TO DETECT PRESENCE OF PRINTS IN CONVEYOR LINES

Gerald R. Strunc, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 19, 1980, Ser. No. 122,434

Int. Cl.[3] B65H *35/06*

U.S. Cl. 83—79 **16 Claims**



1. A photographic print cutting and sorting apparatus for cutting individual photographic prints from a continuous roll of processed photographic prints and sorting the prints into good, remake and reject prints, the apparatus comprising:

cutting means for cutting individual prints from a continuous roll of processed photographic prints;

a main conveyor line for receiving the individual prints cut by the cutter means, the main conveyor line having a good print discharge end at which good prints are discharged;

a first branch conveyor line having a remake print discharge end at which remake prints are discharged;

a second branch conveyor line having a reject print discharge end at which reject prints are discharged;

indicia sensing means for sensing indicia associated with the prints indicative of whether an individual print is a good, remake or reject print, the indicia sensing means providing signals as a function of the sensed indicia;

diverting means for diverting remake prints into the first branch conveyor line and diverting reject prints into the second branch conveyor line;

print sensor means for providing signals when a print has reached one of the discharge ends; and

control means for controlling the cutter means and the diverting means as a function of signals from the indicia sensing means and the print sensor means; wherein if a print being conveyed is a remake or reject print, the control means prevents the cutter means from cutting another print until it receives a signal from the print sensor means indicating that the remake or reject print has reached the remake print or reject print discharge end; and wherein if a print being conveyed is a good print, the control means permits the cutter means to cut, prior to receiving a signal from the print sensor means indicating that the good print has reached the good print discharge end.

4,255,995

DUST CONFINING AND COLLECTION HOUSING FOR POWER TABLE SAWS AND THE LIKE

J. Franklin Connor, 228 Windsor Ave., Upper Darby, Pa. 19082

Filed Jan. 24, 1980, Ser. No. 115,029

Int. Cl.[3] B27G *3/00;* **B23D** *45/06*

U.S. Cl. 83—100 **19 Claims**

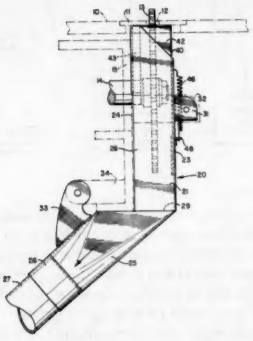
1. In a power saw having a saw blade mounted on a rotatable shaft which is disposed below a slotted work table through which the saw blade protrudes upwardly to work sawing position, said saw blade and shaft being selectively displaceable vertically and angularly relative to the table and being connected for angular movement to a selectively tiltable support

cradle, a dust confining and collection housing surrounding the portion of the saw blade below the table comprising

(a) a hollow enclosure having spaced side and spaced end walls, said enclosure having an open top disposed in contiguous relation to the table and an open bottom connected to a source of suction,

(b) fastening means securing the enclosure to the tiltable support cradle, whereby the housing is rendered angularly moveable in harmony with and in fixed relation to the angular movement of the saw blade and shaft,

(c) a first side wall of the enclosure having a stationary component and a slidable component moveable up or down relative to the stationary component,



(d) resilient means disposed on the enclosure for maintaining the slidable component of the first side wall in contiguous relation to the table when the saw blade, shaft and housing are displaced angularly relative to the table,

(e) a second side wall of the enclosure having an opening through which the shaft for the saw blade extends, said opening being larger than the cross section of the shaft to permit the saw blade and the shaft to be displaced vertically relative to the table and the enclosure, and

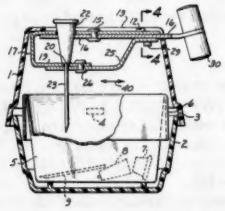
(f) shutter means disposed on the enclosure for maintaining the open portion of the opening in the second side wall closed at each location to which the saw blade and shaft are displaceable relative to the table.

4,255,996

NEEDLE DESTROYER WITH IMPROVED MECHANICAL ADVANTAGE

Pradip V. Choksi, Northridge, Calif.; William D. Christoffel, Two Rivers, Wis., and Christopher J. C. Edwards, Woodland Hills, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 19, 1979, Ser. No. 97,263
Int. Cl.³ B23D *21/06, 17/00*
U.S. Cl. 83—140 **28 Claims**



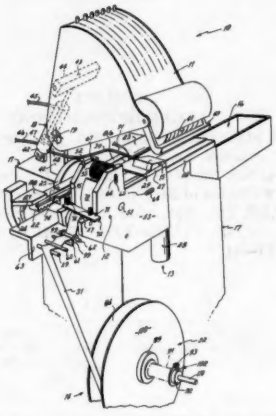
1. A needle destroyer with a common opening for receiving and severing both the hub and cannula of a needle, wherein the improvement comprises: a hub cutter and a cannula cutter on the destroyer joined to each other at a movable joint providing a greater mechanical advantage at the cannula cutter than at the hub cutter when the joined cutters are actuated.

4,255,997

LABEL MACHINE

Bobby J. Clay, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio

Division of Ser. No. 920,178, Jun. 29, 1978. This application Jun. 4, 1979, Ser. No. 45,203
Int. Cl.³ B26D *7/14*
U.S. Cl. 83—175 **4 Claims**



1. A machine for forming tape sections of a predetermined length from a supply reel of an endless tape strip, said machine comprising

a drive ro'l adapted to contact said endless strip, said drive roll withdrawing said endless strip from said supply reel in response to rotation of said drive roll,

tensioning structure cooperable with said drive roll for maintaining tension on said endless strip as said strip is withdrawn from said supply reel, said drive roll and tensioning structure defining a desired planar travel path for said endless strip through said machine,

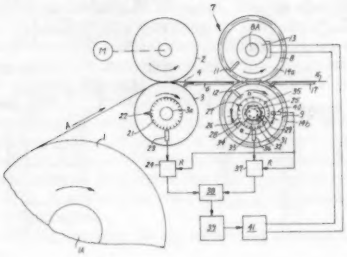
a cutter assembly operable to cut tape sections from said endless tape strip, and

tape alignment mechanism operable to align and to maintain alignment of, the center plane of said supply reel and the center line of said tape strip with the desired planar travel path of said endless strip through said machine, said alignment mechanism including a spool adjustment structure operable to adjust and to maintain said supply reel laterally relative to the desired planar travel path of said tape strip as said tape strip is withdrawn from said supply reel, and including tape strip adjustment structure operable to adjust said tape strip laterally relative to the desired planar travel path of said tape strip after said tape strip has been withdrawn from said supply reel.

4,255,998
APPARATUS FOR CUTTING PAPER WEBS OR THE LIKE

Willy Rudszinat, Dassendorf, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,964
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749174
Int. Cl.[3] B26D *5/24;* A24C *5/28*
U.S. Cl. 83—298 7 Claims

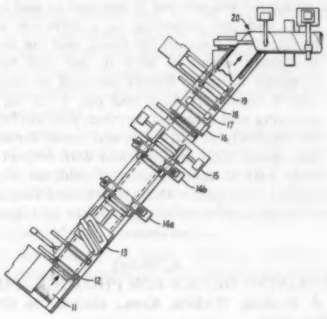


1. Apparatus for subdividing a running web of paper or the like into sections of desired length, comprising means for advancing the web lengthwise along a first path at a predetermined speed; rotary cutter means including at least one knife orbiting along an endless second path a portion of which is adjacent said first path so that the knife makes a cut transversely across the running web while moving along said portion of said second path whereby the web yields a succession of discrete sections whose length is a function of the duration of intervals which elapse between successive movements of said knife along said portion of said second path; a variable-speed prime mover for said cutter means; control means for varying the speed of said prime mover during each revolution of said cutter means so as to drive said knife at a first speed which matches said predetermined speed while the knife moves along said portion of said second path and at one of a plurality of different second speeds while the knife moves from and back to said portion of said second path, said control means including means for generating first signals denoting said predetermined speed and means for maintaining the speed of orbital movement of said knife in said portion of said second path at said predetermined speed in response to said first signals, said means for generating said first signals comprising a rotary element having equidistant indicia, means for rotating said element at a speed which is proportional to said predetermined speed and signal generating detector means arranged to monitor said indicia and to transmit said first signals at a constant frequency, said maintaining means including means for respectively generating second and third signals during movement of said knife along said portion of said second path and during movement of said knife from and back to said portion of said second path, said second signals being a function of said first signals and said maintaining means further including means for regulating the speed of said prime mover as a function of said second and third signals, said means for generating said second and third signals including a second rotary element having a first set of equidistant indicia and a second set of indicia, means for rotating said second element in synchronism with said cutter means and transducer means arranged to monitor the indicia of said second element and to respectively transmit said second and third signals on duration of indicia of said first and second sets; and means for adjusting said control means to select the second speed and hence the duration of said intervals, said adjusting means including means for varying said third signals.

4,255,999
METHOD AND APPARATUS FOR REMOVING CAMBER FROM STRIP

Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Filed Nov. 17, 1978, Ser. No. 961,758
Int. Cl.[3] B26D *7/26*
U.S. Cl. 83—367 17 Claims



1. In apparatus for removing camber from strip preparatory to forming helical pipe, including an uncoiler, a slitter and means for feeding strip from the uncoiler to and through said slitter, the improvement comprising:

sensing means for detecting lateral deviations of the strip relative to a directional reference line of feed between the uncoiler and slitter, said sensing means comprising a pair of longitudinally spaced contacts engageable with the strip and laterally moveable with the strip;

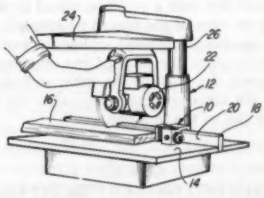
means for positioning the strip laterally relative to the directional line of feed;

and control means responsive to said sensing means for operating said means for positioning the strip and realigning the strip in response to lateral movements of said strips and contacts.

4,256,000
ADJUSTABLE WORKSTOP

Charles Seidel, 436 Girard, Royal Oak, Mich. 48073

Filed Jun. 4, 1979, Ser. No. 44,920
Int. Cl.[3] B27B *27/10*
U.S. Cl. 83—468 4 Claims



1. For use in conjunction with a radial saw means having a table upon which work to be machined is supported, an elongated fence secured to the table, said fence protruding upwardly from said table and forming a substantially vertical surface against which at least a portion of the work is positioned, and machining means movable across said table in a direction transverse to said fence, a work positioning device comprising:

a body,

means for longitudinally infinitely adjustably securing said body to said fence,

said body further comprising a first part and a second part,

said first body part being rigidly attached to the fence by said securing means,

said second body part having a workstop surface substantially perpendicular to said vertical surface and against which the work is positioned; and

means for adjustably securing said body parts together in a direction substantially parallel to said fence,

wherein said means for adjustably securing said body parts together further comprises,

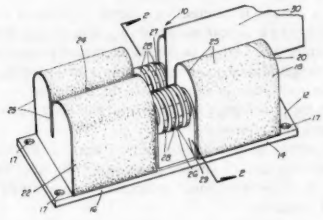
an elongated pin secured at one end to said second body part, said pin extending in a direction substantially parallel to the axis of the fence, said pin being slidably positioned within a bore in the first body part, a threaded member fixedly secured to and extending axially outwardly from said pin, a nut for threadably engaging said threaded member, said nut being accessible exteriorly of said body, and means for securing said nut against axial displacement with respect to the first body part so that rotation of said nut displaces said second body part with respect to said first body part in a direction substantially parallel to said fence.

4,256,001

ANTI-SKIVING DEVICE FOR PHOTOGRAPHIC FILM

Frank J. Russold, Wichita, Kans., assignor to Kreonite Inc, Wichita, Kans.

Filed Mar. 1, 1979, Ser. No. 16,445
Int. Cl.³ B26D *3/02*
U.S. Cl. 83—869 **4 Claims**



1. An anti-skiving device for photographic film, the device beveling the sides of an edge of photographic film so that a layer of emulsion and anti-halation backing on the film will not flake or skive when the film is processed, the device comprising:

a base;

a first film guide mounted on the base and having an elongated guide slot with a pre-determined depth therein for receiving an edge of the film to be beveled; and

a pair of parallel sharpening cylinders having rotatable spaced-apart discs, the discs of one cylinder overlapping and adjacent the discs of the other cylinder, the depth between the discs corresponding with the depth of the elongated slot of the first film guide.

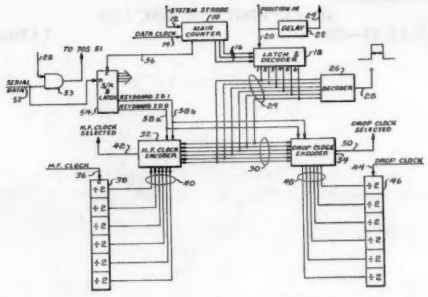
4,256,002

LARGE SCALE INTEGRATED CIRCUIT GENERATOR CHIP FOR ELECTRONIC ORGAN

Harold O. Schwartz, Elburn, and William R. Hoskinson, Geneva, both of Ill., assignors to The Wurlitzer Company, DeKalb, Ill.

Filed Jun. 20, 1978, Ser. No. 917,314
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **6 Claims**

1. A plurality of like large scale integrated circuit chips for use in an electronic organ or the like having a keyboard and multiplexed key switches, each of said chips having a counter, means for synchronizing the counters of said plurality of chips, each chip having a high frequency clock input receiving a high frequency clock signal from outside of said chip, a string of divide-by-two circuits driven by said high frequency clock receiving input and having a plurality of octavely-related outputs, a high frequency clock encoder receiving said octavely-related divide-by-two outputs, each chip having a position in connection and a position out connection, delay means connecting the position in and the position out connections of each chip, means combining the counter output information



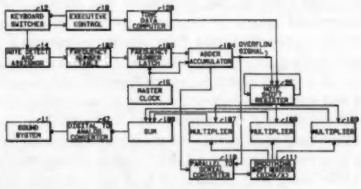
and the position in information means connecting said combining means to said high frequency clock encoder to limit the output thereof to a particular octave, and an assignable frequency synthesizer connected to said high frequency clock encoder output to determine the octave in which said frequency synthesizer will operate, and means external of said chips interconnecting the position out connection of one chip with the position in connection of a succeeding chip.

4,256,003

NOTE FREQUENCY GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jul. 19, 1979, Ser. No. 58,882
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **14 Claims**



1. In combination with a keyboard musical instrument having a waveshape memory storing a plurality of data words corresponding to the amplitudes of a corresponding number of evenly spaced points defining a cycle of an audio musical signal and in which said data words are sequentially and repetitively read out of the waveshape memory and transferred to a digital-to-analog converter at an average rate proportional to the pitch of the musical tone being generated wherein said average rate is generated by a non-integer frequency divider,

apparatus for reducing undesired frequency components produced by said non-integer frequency divider comprising;

a waveshape memory storing in memory locations said plurality of data words,

a frequency number means for providing digitally coded values corresponding to the fundamental frequencies of musical notes produced by said musical instrument,

a first clock means for providing timing clock pulses,

assignor means whereby a frequency number is accessed from said frequency number means in response to an actuated key on said keyboard,

an adder-accumulator means, operative at each timing clock pulse from said first clock means, wherein said frequency number accessed by said assignor means is added to the contents of said adder-accumulator and wherein the adder-accumulator generates an overflow signal whenever the accumulated value exceeds the capacity of the accumulator,

a first addressing means whereby a sequence of M consecutive data words are cyclically and repetitively addressed out from said waveshape memory and wherein the waveshape memory location of the first data word in said sequence of consecutive data words is advanced by said overflow signal,

a smoothing memory storing smoothing function data values,

a second addressing means responsive to the contents of said adder-accumulator means whereby a sequence of smoothing function data values equal in number to said number M are addressed out from said smoothing memory,

a plurality of multiplying means, each corresponding to one of said plurality of M data words addressed out from said waveshape memory, wherein said addressed data words are multiplied by said smoothing function data values addressed out from said smoothing memory,

a summing means for adding all the product values provided by said plurality of multiplying means to generate an output data set and thereby reducing said undesired frequency components, and

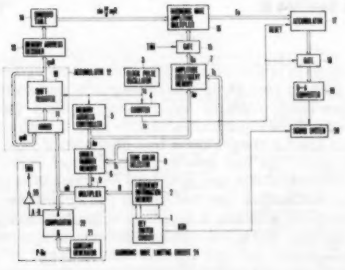
a signal conversion means wherein the output of said summing means is converted to an analog signal.

4,256,004

ELECTRONIC MUSICAL INSTRUMENT OF THE HARMONIC SYNTHESIS TYPE

Chifumi Takeuchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 20, 1979, Ser. No. 32,092
Claims priority, application Japan, Apr. 24, 1978, 53-48402
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.21 **7 Claims**



1. An electronic musical instrument of a harmonic synthesis type comprising:

means for generating a frequency information output representative of a tone pitch of a depressed key of a keyboard of said electronic musical instrument,

harmonic number memory means for storing harmonic numbers representative of corresponding harmonic wave components required to produce a selected tone color of a musical tone to be produced,

amplitude coefficient memory means for storing amplitude coefficients representative of the amplitudes of the respective harmonic wave components corresponding to the respective harmonic numbers stored in said harmonic number memory means,

means responsive to the output of said frequency information generating means and to the harmonic numbers stored in said harmonic number memory means for producing a plurality of tone partial component waves having instantaneous wave values, each partial component wave being representative of a respective one of said harmonic wave components,

multiplying means for multiplying said instantaneous wave values of each partial component wave by the coefficient from said amplitude coefficient memory device corresponding with the harmonic wave component represented by that partial component wave to produce a product signal representative thereof, and

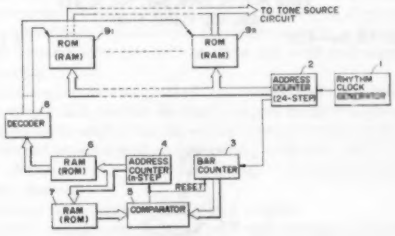
means for synthesizing an audio signal in response to the product signal produced by said multiplying means.

4,256,005

RHYTHM GENERATOR

Toshio Mishima, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jul. 30, 1979, Ser. No. 61,768
Claims priority, application Japan, Aug. 11, 1978, 53/98043
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **1 Claim**



1. A rhythm generator comprising:

a plurality of rhythm pattern memories to be read out in a predetermined sequence, each storing a different rhythm pattern and outputting its respective rhythm pattern in response to an addressing means;

a bar counter for counting the number of bars being read out from each sequentially read out rhythm pattern memory;

a first memory storing said predetermined sequence in which said plurality of rhythm pattern memories is to be read out;

a second memory storing the number of bars for which each rhythm pattern memory in said sequence is to be read out;

a comparator for comparing the output from the bar counter with the output from the second memory to provide a coincidence signal; and

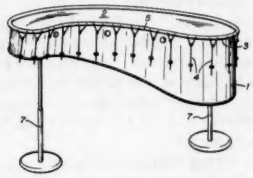
an address counter addressing said first and second memories, said address counter being responsive to the coincidence signal to increment the count value of said address counter, whereby each rhythm pattern memory in said sequence is read out for said predetermined number of bars.

4,256,006

MULTI-TONE PERCUSSION INSTRUMENT

G. Paul Widener, 5910 San Bernardo, #165, Laredo, Tex. 78041

Filed May 10, 1979, Ser. No. 37,540
Int. Cl.[3] G10D *13/02*
U.S. Cl. 84—411 R 7 Claims



1. A drum for producing a multiple number of resonant and musical tones comprising:

a flexible membrane vellum forming the vibrating head portion of the drum, said vellum being mounted on a shell rim constructed such that the surface of said vellum comprises a compound warp when affixed thereto.

4,256,007

PERCUSSION INSTRUMENT CARRIER

James L. Streit, 709 W. Third St., Wilbarger County, Tex. 79252

Filed May 4, 1979, Ser. No. 35,911
Int. Cl.[3] G10G *5/00*
U.S. Cl. 84—421 6 Claims

1. A percussion instrument carrier comprising:

rigid supportive frame means for suspending said carrier from a marcher, said frame means comprising:

a pair of spaced-apart hook members for resting upon shoulder blades of said marcher;

rear support means integral with said hook members adapted to rest upon the back of said marcher; and

first and second spaced-apart, substantially parallel elongated members integral with said hook members and said rear support means;

a pair of elongated, spaced-apart arm members adapted to secure said percussion instrument in a playing position; and

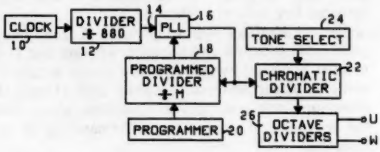
means for coupling said arm members to said supportive frame.

4,256,008

MUSICAL INSTRUMENT TUNER WITH INCREMENTAL SCALE SHIFT

Donald C. Ryon, Carol Stream, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 17, 1979, Ser. No. 39,923
Int. Cl.[3] G10G *7/02*
U.S. Cl. 84—454 8 Claims



1. Scale shifting circuitry for providing a plurality of frequencies having a predetermined frequency relationship and for shifting said plurality of frequencies by predetermined increments, and comprising in combination:

first oscillator means for providing a fixed frequency signal which is substantially higher than said plurality of frequencies;

a phase locked loop coupled to receive an output signal of the first oscillator means and including a second oscillator means adapted to provide an output signal at a frequency substantially higher than the output signal from the first oscillator means;

first programmed divider means coupled to receive the output signal from the second oscillator means of the phase locked loop, to divide said output signal by ones of a first plurality of numbers related to said predetermined incremental frequency shifts, and to couple the divided signal to the phase detector of the phase locked loop;

chromatically programmed divider means coupled to receive the output signal from the second oscillator means, and to divide said output signal by ones of a second plurality of numbers related to said plurality of frequencies; and

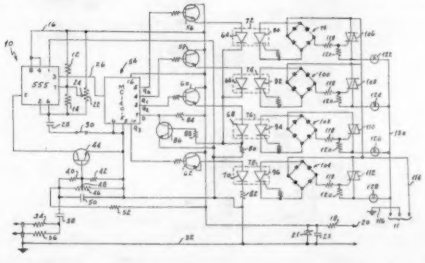
output means coupled to the chromatically programmed divider means.

4,256,009

DISCO LAMP CONTROLLER FOR COIN-OPERATED PHONOGRAPH

Lee C. Verduin, Grand Rapids, and Paul E. Kitchka, Sparta, both of Mich., assignors to Rowe International, Inc., Whippany, N.J.

Filed Nov. 6, 1978, Ser. No. 958,154
Int. Cl.[3] A63J *17/00*
U.S. Cl. 84—464 R 7 Claims

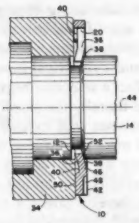


7. In a phonograph having means for producing an audio signal incorporating a musical rhythm, apparatus including a plurality of devices activatable to produce light, and means responsive to said audio signal for activating said devices in sequence in accordance with said musical rhythm.

4,256,010
BEVELED RETAINING RING AND METHOD FOR CONSTRUCTING THE SAME

John A. Petrie, 16 Weebetook La., Cincinnati, Ohio 45208

Division of Ser. No. 882,637, Mar. 2, 1978, Pat. No. 4,184,242.
This application May 2, 1979, Ser. No. 35,420
Int. Cl.[3] F16B *21/18*
U.S. Cl. 411—518 10 Claims

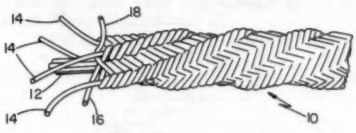


1. A split retaining ring comprising a generally circular body having a plurality of circumferentially spaced grooves in the radially inner or outer edge of said body, said grooves being divided by prongs which are uniformly bent at an abgle to the ring body to form groove reception flanges having inclined groove seating surfaces, said prongs being uniformly bent twice in opposite directions to form V shape members with the free legs thereof forming the groove reception flanges which are substantially coplanar at the ends thereof with one sidewall of the ring body.

4,256,011
BRAIDED PACKING AND METHOD AND APPARATUS FOR MAKING PACKING

Peter F. Kozlowski, Billerica, Mass., assignor to A. W. Chesterton Company, Stoneham, Mass.

Continuation-in-part of Ser. No. 754,254, Dec. 27, 1976, Pat. No. 4,100,835. This application Jul. 14, 1978, Ser. No. 924,520
The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.
Int. Cl.[3] D04C *1/06*
U.S. Cl. 87—6 5 Claims



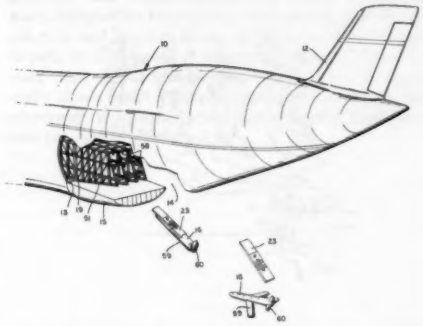
1. Braided packing comprising a plurality of outer core strands extending generally axially along said packing and a plurality of braid strands braided together about said core strands, said outer core strands extending helically along said packing and forming with said braid strands a braid having a normal helical twist in one direction and said braid strands extending over said core strands in one helical direction at an angle to said outer core strands and said normal helical twist.

3. Braided packing comprising a plurality of outer core strands extending generally axially along said packing and a plurality of braid strands braided together about said core strands, said outer core strands extending helically along said packing and forming with said braid strands a braid having a normal helical twist in one direction and said braid strands extending over said core strands in one helical direction at an angle to said outer core strands and said normal helical twist, said packing further comprising rows of warp strands between rows of said braid strands, said warp strand rows extending helically along said packing in the direction of said normal helical twist and said warp strands extending in a helical direction opposite that in which said braid strands extend.

4,256,012
MISSILE LAUNCHER FOR AIRCRAFT

William L. Cowart, Chamblee; Cropper W. Holland, Jr., and Don R. Scarbrough, Sr., both of Marietta, all of Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Nov. 20, 1978, Ser. No. 962,560
Int. Cl.[3] B64D *1/10*
U.S. Cl. 89—1.816 7 Claims



1. The combination with an aircraft having an internal storage compartment, an access opening in said aircraft to said compartment, and a removable and replaceable closure for said opening, of a missile launcher adapted for installation in said compartment comprising:

at least one transport module formed by at least one missile-carrying cell releasably secured in a fixed position in said compartment, each said transport module being disposed with its missile in end-to-end alignment with the missile of the next adjacent transport module and with said access opening;

an acceleration module formed by a corresponding number of empty cells similar to said transport module cells secured to the end of the last of said transport modules and disposed adjacent said access opening with each of its cells in alignment with one of said transport module cells and said opening;

a carriage superimposed above each missile;

a slidable engagement between each said carriage and each said aligned transport module and acceleration module cell;

a first connector between each transport module cell and the associated carriage to secure them against relative movement;

a second connector between each carriage and its associated missile to secure them against relative movement; and

a release operable between each said first and second connectors respectively to disconnect each said carriage from its cell and each said missile from its carriage.

4,256,013
MULTIPLE TARGET WEAPONS SYSTEM

Dominick J. Quitadama, 490 Forest Ave., Paramus, N.J. 07652

Filed Mar. 30, 1979, Ser. No. 25,680
Int. Cl.[3] F41C *19/12*
U.S. Cl. 89—41 TV 13 Claims

1. A weapons system for firing simultaneously at every one of a plurality of targets, said weapons system comprising:

a plurality of guns each capable of being aimed, by an operator associated with each gun, at a different selected one of a corresponding plurality of targets;

fire-ready means in each gun for operation by the associated

operator to place each gun in fire-ready condition when that particular gun is aimed at the corresponding selected target;

indicating means associated with each gun for indicating to the operator of that gun when every gun is in fire-ready condition;

firing means in each gun for firing that gun; and

control means associated with all of the guns for actuating every firing means simultaneously in response to the placement of every gun in fire-ready condition, whereby the plurality of guns will be fired simultaneously at the plurality of targets.

4,256,014

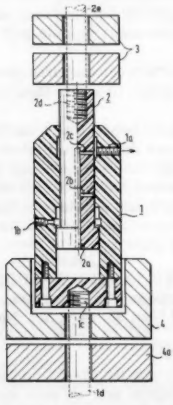
PISTON VIBRATOR

Dietrich Kröger, Breckenheim, Fed. Rep. of Germany, assignor to Grumag Geraete- und Maschinen GmbH, Rheinfelden, Switzerland

Continuation of Ser. No. 832,505, Sep. 12, 1977, abandoned, which is a continuation of Ser. No. 631,063, Nov. 12, 1975, abandoned. This application Feb. 5, 1979, Ser. No. 9,354

Int. Cl.[3] F01B *7/18*; F01L *21/02*; F01B *15/00*

U.S. Cl. 91—216 B **5 Claims**



1. In a piston vibrator for connection to a structural member to cause a vibration thereof comprising a cylindrical housing having a chamber with a free floating piston therein which is axially movable in a translational manner by a pressurized medium, the improvement comprising at least one of said piston and said cylinder housing being made of a lightweight material, first coupling means on said piston and second coupling means on said cylindrical housing, and mass amplifying means, said first coupling means being selectively connected to one of said structural member and said mass amplifying means, said second coupling means being selectively connected to the other of said structural member and said mass amplifying means, said piston vibrator being changeable end for end so that when said mass amplifying means is connected to said piston by said first coupling means, said second coupling means effects a coupling of said cylindrical housing to said structural member to thereby effect a selective regulating of the effective mass of said piston and thereby the amplitude and frequency of relative movement between said cylindrical housing and said piston, and when said mass amplifying means is connected to said cylindrical housing by said second coupling means, said first coupling means effects a coupling of said piston to said structural member to thereby effect a selective regulating of the effective mass of said cylindrical housing and thereby the amplitude and frequency of relative movement between said cylindrical housing and said piston, whereby a first range of selection of the amplitude and frequency of vibratory movement is selective for said structural member, said mass amplifying means and said piston connected together and a second range of selection of the amplitude and frequency of vibratory movement is selective for said structural member, said mass amplifying means and said cylindrical housing connected together.

4,256,015

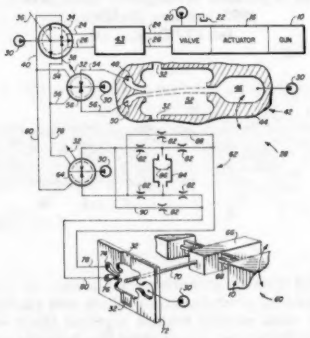
FLUIDIC STABILIZATION CONTROL

Thomas B. Tippetts, Mesa, Ariz., and Francis M. Manion, Rockville, Md., assignors to The Garrett Corporation, Los Angeles, Calif. and United States of America, Washington, D.C.

Filed Dec. 8, 1978, Ser. No. 967,812

Int. Cl.[3] F15B *13/16*

U.S. Cl. 91—364 **24 Claims**



1. In a fluidic control system generating a fluidic rate signal indicative of rate of movement of a body in a preselected direction, wherein said body has a characteristic natural bending frequency as said body moves in said direction; a fluidic notch filter for reducing said fluidic rate signal to a minimum value at said natural frequency, comprising:

sensor means operably coupled with said body for generating a fluidic acceleration signal indicative of acceleration of said body in said direction, said sensor means having a mass with a natural frequency approximately equal to said body natural frequency, the magnitude of said fluidic acceleration signal being approximately equal to the magnitude of said rate signal at said natural frequency but substantially less at other frequencies; and

fluidic circuit means for combining said rate signal and acceleration signal to reduce said rate signal to said minimum value at said natural frequency.

4,256,016

SERVO BOOSTER FOR VEHICLE BRAKING SYSTEMS

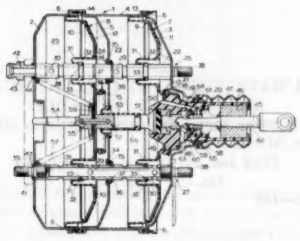
Alfred W. Thomas, Koblenz, Fed. Rep. of Germany, assignor to Girling Limited, Birmingham, England

Filed May 21, 1979, Ser. No. 40,910

Claims priority, application United Kingdom, May 20, 1978, 20992/78; Oct. 18, 1978, 41038/78

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 A **12 Claims**



1. A servo booster assembly for a vehicle braking system comprising a housing, opposed housing walls of said housing, a movable wall positioned intermediate said opposed housing walls and dividing the interior of said housing into two chambers, an output member, an input member, a control valve assembly controlling the differential pressure of said chambers, said movable wall being arranged to apply a force to said output member when the movable wall is subjected to a pressure differential, a stationary force transmitting means extending between said opposed housing walls and through said movable wall, and means sealing said movable wall to said force transmitting means, said force transmitting means being formed with a passage.

4,256,017

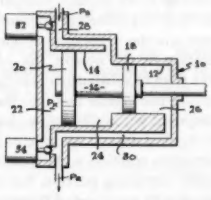
DIFFERENTIAL AREA ELECTROHYDRAULIC DOSER ACTUATOR

James M. Eastman, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Apr. 5, 1979, Ser. No. 27,343

Int. Cl.³ F15B *15/17*

U.S. Cl. 91—417 R **19 Claims**



1. An electrohydraulic doser actuator comprising a housing having a bore therewithin;

piston means contained by said bore and axially movable therein, said piston means having at least one hydraulic fluid pressure-responsive surface area, said surface area defining a variable volume hydraulic fluid control chamber in a portion of said bore;

means for exerting a constant force upon said piston means in a direction which causes said piston means to axially move to reduce the volume of said control chamber;

valve means operatively connected to said control chamber for selectively venting a quantity (dose) of pressurized hydraulic fluid either to or from said control chamber thereby axially moving said piston means in opposite directions within said bore to either increase or reduce respectively said volume of said control chamber;

control means for controlling said valve means to vary said quantity (dose) of said hydraulic fluid vented to or from said control chamber thereby effecting axial movement of said piston means to desired axial positions;

said valve means including a first valve to vent said fluid quantity (dose) to said control chamber and a second valve to vent said fluid quantity (dose) from said control chamber, said valves having only on-off operational states, being either fully open or fully closed, respectively, whereby said quantity (dose) of hydraulic fluid depends, in part, on the amount of time said orifices are in said on state, each of said first and second valves having a normally closed position thereby establishing in said position a hydraulic lock on said piston means thereby maintaining said last desired axial position.

4,256,018

RADIAL PISTON FLUID ENGINE

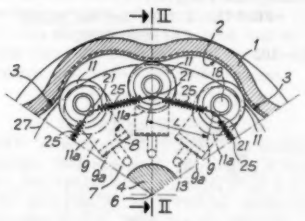
Jean-Pierre Badoureaux, and Jean-Francois Cheylus, both of Compiegne, France, assignors to Poclain Hydraulics, Verberie, France

Filed Apr. 12, 1979, Ser. No. 29,750

Claims priority, application France, May 22, 1978, 78 15070

Int. Cl.³ F01B *13/06*

U.S. Cl. 92—58 **6 Claims**



1. A pressurized fluid engine comprising

a cam surface having a wavelike configuration;

a cylinder block mounted to rotate about an axis with respect to said cam surface and including a plurality of cylinders arranged radially therein with respect to the axis of rotation;

a plurality of pistons each slidably mounted in a respective one of said cylinders and adapted to bear against the cam surface under the force of pressurized fluid; and

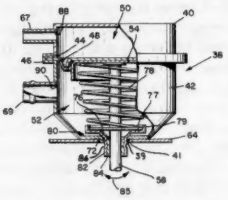
an elastic device for returning said pistons to a retracted position inside their respective cylinders, said device including separate drawing springs at least equal in number to the number of pistons for biasing said pistons to said retracted position and a plurality of levers each mounted to pivot with respect to one piston about an axis parallel to the axis of rotation of the cylinder block, the number of said levers being equal to the number of said springs, and each lever constituting a link between two springs and each spring coupled to two levers.

4,256,019

TURBOCHARGER CONTROL ACTUATOR

Peter W. Braddick, Fullerton, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 12, 1979, Ser. No. 47,841
Int. Cl.³ F01B *19/00*; F16J *3/02*
U.S. Cl. 92—94 **18 Claims**



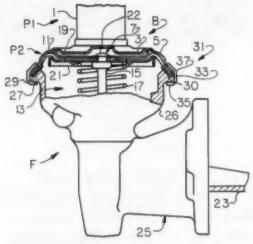
1. A turbocharger control actuator comprising a housing; a pressure responsive diaphragm dividing said housing into a pair of chambers; an actuator rod having one end coupled to said diaphragm for movement therewith and extending therefrom out of said housing through an opening formed in said housing; sealing means pivotally received through said opening and including an annular retainer with a sealing seat in pivotally sealing bearing engagement with said housing adjacent said opening for accommodating angular movement of said rod, and a cylindrical portion concentrically received about said rod, and including bushing means concentrically secured within said cylindrical portion and slidably received about said rod for allowing sliding sealed axial movement of said rod; and spring means compressively retained between said diaphragm and said sealing means for predeterminably biasing said diaphragm and for urging said sealing means into pivotally sealing relation with said housing.

4,256,020

CRASHWORTHY FUEL PUMP IMPROVEMENT

Donald R. Compton, Belleville, Ill., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,265
Int. Cl.³ F04B *43/02*
U.S. Cl. 92—102 **5 Claims**



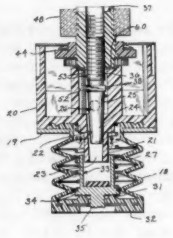
1. In a fuel pump for use in an automotive fuel system the fuel pump including a body having a first portion in which is formed a fuel intake cavity and a fuel discharge cavity and a second portion in which is formed a fuel pumping chamber, one end of each cavity being in fluid communication with the pumping chamber, a flexiable diaphragm closing the pumping chamber, the diaphragm being insertable into the open end of the second portion of the body, means for flexing the diaphrgm to pump fuel into and out of the pumping chamber through the respective intake and discharge cavities and a housing in which the flexing means is housed, the housing having one end formed for abutment with the open end portion of the body, the improvement comprising a lip formed around the periphery of the open portion of the body, the lip being bendable over the outer margin of the diaphragm to clamp the diaphragm within the body and form a fluid seal therewith, means for clamping the body and housing together to form a unified assembly, and means adjacent the diaphragm and within the seal formed between the diaphragm and the lip for sealing any fluid leak which may be created when the fuel pump assembly is subjected to abnormal forces such as occur during a crash.

4,256,021

PNEUMATIC TIMER WITH ECCENTRICALLY DISPOSED VALVE NEEDLE

Frank J. Graninger, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jun. 21, 1979, Ser. No. 50,752
Int. Cl.³ F01B *29/08*
U.S. Cl. 92—143 **3 Claims**



1. In a pneumatic timing device with improved adjustability, the combination comprising:

a bellows;

a body having a valve chamber and having a passageway of substantially circular cross section that extends along a longitudinal axis from the valve chamber into the interior of the bellows, the body forming a valve seat around the passageway;

a valve needle with a longitudinal needle axis, with a shaft disposed for axial movement in the valve chamber and with a non-circular cross section portion formed around its shaft, positioned within the valve chamber, and cooperating with a non circular cross section portion of the body to restrict rotation of the needle, the valve needle also forming a valve stem of substantially circular cross section that extends along the needle axis into the passageway;

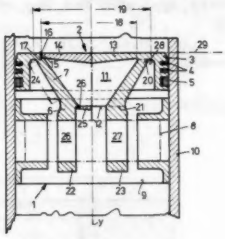
biasing means, disposed within the valve chamber in relative sliding contact against at least one side of the valve needle portion that restricts rotation and extending the distance traveled by such restricting portion, for urging the valve stem into contact with a portion of the valve seat, and into a position where the needle axis is spaced off-center from the longitudinal axis of the passageway to form a crescent-shaped bleed area; and

a rotatable adjustment means mounted on the body and coupled to the valve needle for axial movement of the valve needle along the biasing means, the portion of the valve needle that restricts its rotation being in sliding contact with the biasing means to further restrict rotation and to limit tilt of the valve needle, thereby maintaining the shape and the orientation of the bleed area.

4,256,022
PISTON FOR RECIPROCATING INTERNAL COMBUSTION ENGINES, TYPICALLY DIESEL ENGINES

Ludwig Elsbett, and Günter Elsbett, both of c/o Industriestrasse 14, 8543 Hilpoltstein, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,151
Int. Cl.[3] F16J *100, 1/16*
U.S. Cl. 92—190 10 Claims



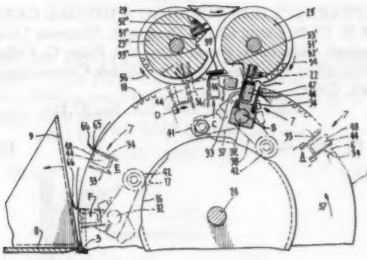
1. In a piston for reciprocating internal combustion engines, typically Diesel engines, with a crown exposed to the heat of the combustion gases and a shell connecting said crown with a guide member which transmits only normal forces and a ring carrier connected to the crown of the piston and provided with sealing and oil control rings which ring carrier is connected by a heat transmission restricting constriction situated near a straight line extending through the crown of the piston to the latter and in which piston the shell connecting the crown with said guide member is formed integrally with the ring carrier and at least a portion of the crown containing said constriction at its end facing away from the crown with a base is formed by two bifurcated legs, said legs being arranged symmetrically to a plane extending through the center of the piston and formed with eyes for a wrist pin connecting said shell with said guide member and a wrist pin passing through said eyes and journalled in said guide member, the improvement comprising said shell being in the shape of a hollow truncated cone integral with the ring carrier and provided in its interior beneath the crown with a cavity said cavity being constructed at least in one direction of the longitudinal axis (axis of rotation Y) of the piston, and means closing the end of said cone at the crown said crown being exposed to the heat of combustion gases, and said cone and said closing means increasing in wall thickness from the constriction to the longitudinal axis of the piston.

4,256,023
BAG MAKING APPARATUS

Umberto Vodarich, Myrtleford Rd., Murmungee, 3747, Victoria, Australia

Filed Feb. 9, 1979, Ser. No. 10,825
Claims priority, application Australia, Feb. 10, 1978, 3340/78
Int. Cl.[3] B31B *1/56, 21/60*
U.S. Cl. 493—266 11 Claims

1. A bag making apparatus comprising:
a frame;
a drum (1) mounted to the frame and adapted to rotate about a first axis (24);
a body (30) mounted to the drum and capable of angular reciprocating movement about a second axis (32) parallel to said first axis, sad body and second axis revolving about said first axis;
a first pair of abutments (33, 46) comprising a first abutment (46) carried by the drum and a second abutment (33) carried by said body;
a second pair of abutments (34, 47) comprising a third abutment (47) carried by the drum and a fourth abutment (34) carried by said body;
means (16, 17, 37, 38, 41, 42) for angularly reciprocating said body about said second axis, as the drum rotates about said first axis, in a first direction, whereby to move said second abutment (33) towards said first abutment (46) and simultaneously to move said third abutment (47) away from said fourth abutment (34) and, in a second, opposite, direction to move said third abutment (47) towards said fourth abutment (34) and simultaneously to move said second abutment (33) away from said first abutment (46), and whereby the abutments of each pair of abutments are co-operable to grip therebetween a part of a sleeve of bag material to be formed into a bag;
means for bonding parts of the sleeve together; and
means for deflecting portions of the sleeve when said sleeve is gripped by said abutments;

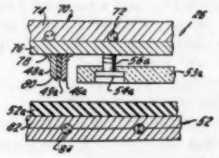


whereby, in use, a first portion of said sleeve is gripped adjacent one end by said first pair of abutments, said one end is caused to overlie a second portion of said sleeve by said deflecting means to form a bag having a first fold and which first fold being stabilized by parts of the sleeve being bonded to one another by said bonding means, said first pair of abutments move to release said first portion and, simultaneously, said second pair of abutments move to grip a third portion of the sleeve adjacent the end defined by said first fold, and said end defined by said first fold is caused to overlie a fourth portion of the sleeve by said deflecting means to form a second fold and which second fold being stabilized by parts of the sleeve being bonded to one another by said bonding means.

4,256,024
METHOD OF FORMING PLASTIC-FILM ARTICLES

Richard S. Carlisle, 1051 Broadway, Thornwood, N.Y. 10594

Division of Ser. No. 714,746, Aug. 16, 1976, which is a division of Ser. No. 427,433, Dec. 21, 1973, Pat. No. 3,975,885. This application Sep. 12, 1978, Ser. No. 941,721
Int. Cl.[3] B31B *1/14*
U.S. Cl. 493—343 3 Claims



1. The method of forming plastic-film articles, including the steps of superposing plural strips of heat-sealable thermoplastic material, and applying pressure of a heated continuous sharp cutting edge and an elongated dull heated sealing member separated by heat-insulating means from said cutting edge directly to one of said thermoplastic strips at one side thereof while applying pressure with rubbery heat-resistant material

directly to another of said superposed strips at the opposite side of the superposed strips, the temperature of the cutting edge being high enough to fuse and penetrate through the thermoplastic strips and the temperature of the sealing member being lower than that of said cutting edge and only high enough to form a fused seam between the thermoplastic strips during application of pressure, the strip engaged by said cutting edge and said sealing member having laminated layers wherein the layer pressed directly by said cutting edge and said sealing member has a melting temperature of at least 50° F. above the melting temperature of the layer which seals with the opposed strip.

4,256,025

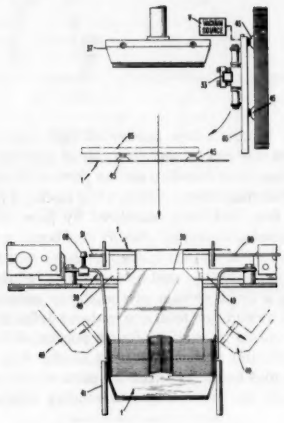
APPARATUS FOR FORMING A HINGED CARTON

Boyd D. Goda, Santa Clara; Thomas E. Simpson; Craig J. St. Vincent, both of Redwood City, and Peter C. Collura, Los Altos, all of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Jul. 12, 1979, Ser. No. 57,116

Int. Cl.³ B31B *1/46*

U.S. Cl. 493—160 **14 Claims**



1. Apparatus for forming a carton from a paperboard blank or the like, the carton having two sections, each section including at least a base panel, wall panels attached to the base panel, and corner panels formed at the corners of the wall panels, the two sections separated by an articulated hinge, and tab panels formed adjacent the hinge comprising:

a carton-forming die for receiving said paperboard blank, said die including:

means for prebreaking said articulated hinge of said carton blank, said hinge prebreaking means accurately locating said carton blank when said blank is placed in contacting registration with said die; and

means for erecting and retaining selected panels of said carton during subsequent folding;

means for sequentially feeding a carton blank from a stack into contacting registration with said carton-forming die, said feeding means including:

means, cooperating with said prebreaking means of said die, for folding and gathering said articulated hinge when said carton blank is placed in contacting registration with said die;

a reciprocating plunger for forcing said gathered carton blank into said die to fold and erect said wall panels of said carton; and

means, disposed beneath said carton-forming die, for receiving and retaining a plurality of said erected and folded cartons in a vertically stacked arrangement, said cartons being nested within one another.

4,256,026

MACHINE TOOL FOR STAMPING AND GROOVING

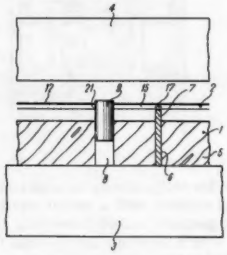
Karl Marbach, Heilbronn, Fed. Rep. of Germany, assignor to Firma Karl Marbach GmbH, Heilbronn, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,536

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831619

Int. Cl.³ B31B *1/20*

U.S. Cl. 493—404 **8 Claims**



1. A stamping and grooving tool for producing folding blanks from sheets of cardboard, paperboard or the like, having a stamping die plate and a strip steel punch plate, which can be fixed on machine stamping plates movable relative to one another, comprising:

(a) a stamping die plate including a circumferential marginal edge and grooves and/or ribs for forming folding grooves in a folding blank;

(b) said die plate including alignment openings or through openings formed therein;

(c) said die plate comprising an adhesive layer on one side with which said die plate can be secured to one machine stamping plate;

(d) said strip steel punch plate including slits for receiving strip steel tools and through openings for receiving alignment pins having a length which differs from said strip steel tool;

said grooves in said stamping die plate mating with said strip steel tools and said alignment openings matching said alignment pins in said strip steel punch plate for aligning said stamping die plate and forming grooves in said folding blanks.

4,256,027

SPIRAL LABELLING

Rolf Strohband, Düsseldorf, Fed. Rep. of Germany, assignor to Guschky & Tönnesmann GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,972

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725116

Int. Cl.³ B31C *3/00*

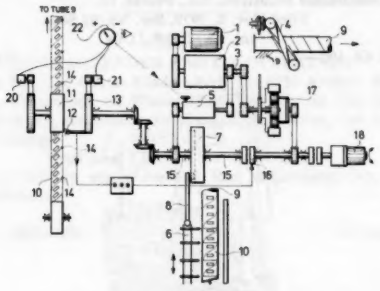
U.S. Cl. 493—11 **15 Claims**

1. A method for the cutting of a helically wound tube made of strips of paper, cardboard or the like with a cutting mechanism, into container cylinders having a labelling constituting a strip of labels wound thereon by a wrapping belt, comprising the steps of

winding strips of material by means of a wrapping belt to form a progressing helically wound tube,

feeding a strip of labels to the tube and helically winding the strip onto said tube,

driving the cutting mechanism along a path parallel to the tube,
cutting the tube with the labelling thereon,
measuring the drive speed of the cutting mechanism and the feeding speed of the strip of labels,
comparing the drive speed of the cutting mechanism with



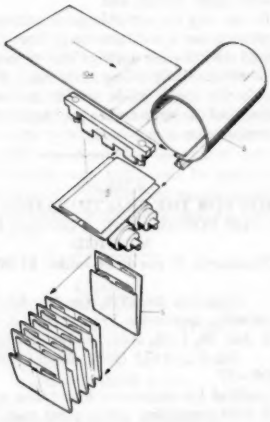
the feeding speed of the strip of labels and providing a comparison value resulting therefrom,
controlling the speed of the wrapping belt by the value resulting from the step of comparing the drive speed of the cutting mechanism with the feeding speed of the strip of labels for correcting the cutting in the event of any difference between the drive speed and the feeding speed.

4,256,028

METHOD AND APPARATUS FOR MAKING PLASTIC PREFORMS FOR PACKAGING CONTAINERS

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 7, 1979, Ser. No. 73,397
Int. Cl.[3] B31B *49/00*; B31C *1/00*
U.S. Cl. 493—287 **26 Claims**



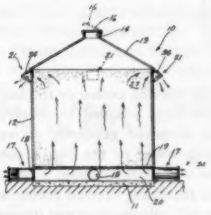
1. The method of making a tubular heat-shrinkable plastic wrap for containers comprising the steps of supplying a lengthy sheet of oriented thermoplastic material in roll form having a prescribed width with its primary orientation extending in a lengthwise direction, said sheet having repetitive decorative patterns on one surface with undecorated space therebetween, delivering the decorated sheet between rollers adapted to length and pattern measurement, severing the sheet at its undecorated spaces into blanks having prescribed width and length dimensions with a decorative pattern thereon, moving said blanks horizontally along a conveyor to a rotary cantilevered mandrel mounted horizontally and transversely thereover, interposing a ramp in the path of an individual blank on said conveyor to elevate said blank into contact with said mandrel, cretaining the leading edge of said blank on said mandrel by vacuum to wrap the same thereon during about one revolution of said rotary mandrel, heat sealing the overlapped edges of said blank on said mandrel while stationarily retained, removing said tubular wrap axially from said mandrel, folding the juxtaposed side poritons of said wrap inwardly to form similar gusset folds and to flatten the wrap, and folding the flattened wrap transversely at an off-center region of its top portion to double-fold said wrap having uneven open edges at its adjacent ends.

4,256,029

PRESSURE REDUCING EXHAUST METHOD AND STRUCTURE FOR VENTILATED GRAIN BINS

Sylvester L. Steffen, and Vincent B. Steffen, both of R.R. 3, New Hampton, Iowa 50659

Filed Oct. 12, 1978, Ser. No. 950,785
Int. Cl.[3] E04H *7/00*
U.S. Cl. 98—55 **1 Claim**

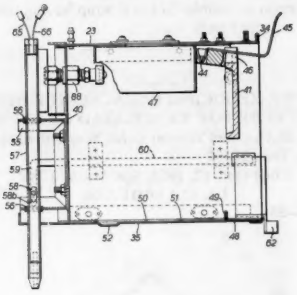


1. A push-pull air movement apparatus including a grain storage bin of the type having a plenum chamber formed in the lower part thereof and a gas-pervious floor forming the top of the plenum chamber for enhancing the movement of air through grain stored within said apparatus comprising:
a grain storage bin;
an intake fan means for pushing air through the grain, said intake fan means connected to the bin and in fluid communication with the stored grain, said intake fan means including a plurality of relatively high speed intake fans distributed about the wall of the plenum chamber;
an exhaust fan means connected to the bin for pulling and exhausting at least as much air volume from the stored grain as the intake fan means inserts, said exhaust fan means including a plurality of relatively large volume, low speed exhaust fans distributed about the top wall portion of the grain storage bin;
said grain bin having a base, a sidewall connected to said base, a roof connected to said sidewall and an opening in an upper portion of said sidewall leading to the grain storage portion of said bin;
a downwardly inclined cylindrical housing attached to said upper portion of said sidewall encompassing said opening; said large volume low speed exhaust fan means attached to and disposed within said cylindrical housing for pulling a large volume of air from the inside of the grain bin;
a plurality of perforated baffle means extending transversely across said opening for allowing said large volume of air to pass therethrough but preventing grain from passing therethrough, said baffle members extending upwardly and outwardly from said sidewalk to retain the grain within the confines of the grain storage portion of the bin; and
means forming a closeable probe opening on the cylindrical housing.

4,256,030
DEVICE FOR MAKING COFFEE OR THE LIKE

Jan de Bruin, Bosch, and Joseph H. Klomp, Bilthoven, both of Netherlands, assignors to Koninklijke Fabriek Inventum Fabriek van instrumenter en elektrische apparaten N.V., Netherlands, 10

Filed Feb. 7, 1979, Ser. No. 10,063
Claims priority, application Netherlands, Apr. 19, 1978, 7804153
Int. Cl.[3] A47J *31/00*
U.S. Cl. 99—295 16 Claims

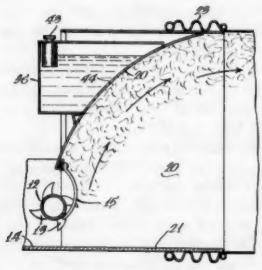


1. A device for making coffee or the like comprising a container, a compartment adapted to receive said container, a perforation unit disposed generally above said container, a boiler for heating water or the like, a substructure disposed generally below said compartment, a holder disposed in said substructure for receiving brewed coffee or the like, a cradle disposed below said substructure and provided with means for interconnection with water and electrical supplies, said substructure being provided with means for detachably engaging said means for interconnection with water and electrical supplies, and said substructure being provided with locking means for securing said substructure to said cradle.

4,256,031
HYDRAULIC CIRCUIT COOLING SYSTEM FOR SILAGE COMPACTORS

Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Company, Blair, Nebr.

Filed Sep. 28, 1979, Ser. No. 79,816
Int. Cl.[3] A01F *25/16;* B65G *3/04*
U.S. Cl. 100—65 2 Claims

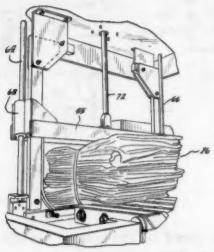


1. In combination with silage compressing apparatus having a hydraulic system for forcing silage under compression through and in heat transfer relationship with a wall of an expanding chamber, hydraulic fluid cooling apparatus comprising a tank having a wall in thermal transfer relationship with said wall of the chamber, and means for circulating hydraulic fluid in said system through said tank.

4,256,032
IMPROVED STRAP GUIDE SYSTEM

James P. Davis, Crawfordsville, Ind., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Nov. 5, 1979, Ser. No. 91,546
Int. Cl.[3] B65B *13/04*
U.S. Cl. 100—26 5 Claims



1. In a package strapping system of the type adapted to encircle a compressible package with a strap, tighten the strap about the package and seal the tightened strap, an improved strap guide and package compression system comprising, in combination:

a strap guide ring having a movable guide section adapted to releasably retain a run of strap,

a movable package compression bar connected to the movable guide section of the strap guide ring and extending longitudinally along the movable guide section, the compression bar having first and second press feet extending longitudinally along the movable guide section on opposite sides thereof and extending beyond the sides of the movable guide section, and

means for moving the movable guide section and connected compression bar toward and away from the package to be strapped whereby the package may be compressed by the press feet uniformly along both sides of the strap contained in the upper guide section and whereby precise placement of the strap on the package in relation to package compression is provided.

4,256,033
METHOD FOR THE FRACTIONATION OF GREEN PLANTS FOR FODDER AND A DEVICE USED IN THE METHOD

Milenko Poznanovic, 14 rue du 14 Juillet, 67 980 Hangenbieten, France

Filed Jun. 26, 1979, Ser. No. 52,255
Claims priority, application France, May 8, 1979, 79 12254; Yugoslavia, Jun. 28, 1978, 1529/78; Jun. 28, 1978, 1530/78
Int. Cl.[3] A47J *19/02;* B30B *15/34*
U.S. Cl. 100—37 11 Claims

1. In a method for successive multiphase splitting and extracting of fluid-containing green plant material into an extracted fluid and a premasticated cellulosic pulp solid portion for fodder comprising primary and secondary splitting and extracting phases. each phase including the steps of compressing and crushing the fluid containing material while conveying it in a first direction along a feed path to extract a portion of the fluid therefrom and subsequently extruding the resultant solid portion from a secondary press, the improvement wherein the extruding of the solid portion includes a controlled further splitting of the solid portion and comprises the steps of subjecting said solid portion in the primary phase to a pulsating compressive force of controlled frequency and amplitude coupled

with rotational shearing and subjecting the compressed solids in the secondary phase to further pulsating compression and shearing of reduced amplitude but of greater frequency than that of the primary phase to provide a substantially greater degree of compression in the secondary phase than in the primary phase thereby providing said premasticated cellulosic pulp.

4,256,034

PAPER CALENDER AND ITS OPERATION

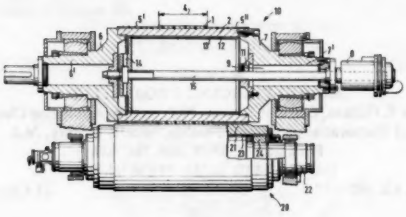
Eduard Küsters, Gustar-Fünders-Web 18, 4150 Krefeld, Fed. Rep. of Germany, and Werner Hartmann, Krefeld, Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Aug. 17, 1979, Ser. No. 67,524

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844051

Int. Cl.³ B30B *15/34*

U.S. Cl. 100—38 **9 Claims**



1. A paper calender comprising at least two substantially matching rotative cylinders for calendering a traveling paper web passed between them, one of the cylinders having a polyurethane coating, means for continuously rotating the cylinders so as to cause the web to travel with a velocity V, means for pressing the cylinders together so as to cause them to have a line pressure P on the web, and means for maintaining the coating at a temperature T during continuous calendering of the web, T being less than a temperature limit T_G which equals $23-v/100-2(P/100)^2$.

4,256,035

REFUSE COMPACTING DEVICE

Jacob J. Neufeldt, c/o Neufeldt Industries, Inc., P. O. Box 597, Lethbridge, Alberta, Canada (T1J 3Z4)

Filed Jan. 2, 1979, Ser. No. 596

Int. Cl.³ B30B *3/00*

U.S. Cl. 100—145 **35 Claims**

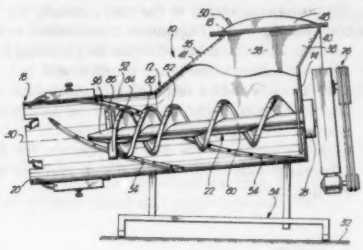
1. A refuse compaction device, comprising:

a housing having at one end a hopper section for receiving refuse material to be compacted and at the other end a compaction section for compacting refuse into a densified plug;

said compaction section communicating with said hopper section for receiving refuse material therefrom and having a refuse material discharge opening;

a rotatable auger screw extending through said hopper section and at least partly into said compaction section for compacting refuse material therein, said auger screw being mounted in cantilever fashion in an end wall of said hopper remote from said compaction section;

means mounting said auger screw in said housing for limited



angular movement in all directions from its normal axis of rotation;

said auger screw being adapted to be drivingly connected to power means for rotatably driving said auger screw.

4,256,036

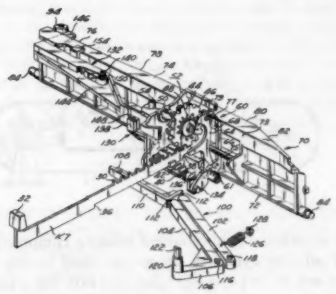
PRINT WHEEL SETTING AND CONTROL MEANS IN PRINTING MACHINES

Lewis E. Sauerwein, Crystal Lake, and Richard L. Gross, Fox River Grove, both of Ill., assignors to AM International, Inc., Los Angeles, Calif.

Filed Sep. 10, 1979, Ser. No. 74,039

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—45 **7 Claims**



1. A data recorder, comprising;

a bed for holding a form to be imprinted;

a platen carriage movable in a path across the bed from a start position to an actuated position to perform a printing operation and back to the start position to complete a printing cycle;

a roller platen supported transversely of the path of the platen carriage;

a plurality of rotatably positionable print wheels in the bed located for printing cooperation with the roller platen;

positioning means for each print wheel movable in a path from a zero position to one of a plurality of selected printing positions for rotating the print wheel to a desired peripheral setting;

reset means movable from an initial position to a final position for moving each of the positioning means from the selected printing position to the zero position;

first actuator means on the reset means for moving the reset means from the initial to the final position in response to movement of the platen carriage to the actuated position;

lock-out means including a locking lever movable from an inactive position to an active position for preventing sub-

sequent movement of the platen carriage from the start to the actuated position;

first biasing means for moving the locking lever from the inactive to the active position in response to movement of the positioning means to the zero position;

second biasing means responsive to movement of the platen carriage from the actuated to the start position for moving the reset means to the initial position; and

second actuator means responsive to movement of at least one of the positioning means from the zero position to a selected printing position for moving the locking lever from the active to the inactive position for permitting subsequent movement of the platen carriage through a printing cycle.

4,256,037

APPARATUS FOR INTERMITTENT PRINTING

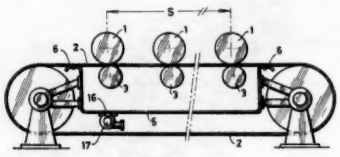
Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork-Brabant B.V., Boxmeer, Netherlands

Filed Jan. 31, 1979, Ser. No. 8,157

Claims priority, application Netherlands, Jan. 31, 1978, 7801102

Int. Cl.³ B41F *15/10, 13/40, 5/06*

U.S. Cl. 101—115 **3 Claims**



1. An apparatus for intermittent printing comprising a plurality of printing cylinders, an endless band having a reach with first and second opposed sides, said first side supporting a material to be printed and movable below said printing cylinders in contact therewith, a plurality of supporting rollers each mounted on a shaft supporting the second side of said endless band and each of said rollers opposed from a respective printing cylinder, means attached to each said supporting roller for displacing individually a said supporting roller in a transverse direction away from and toward a said respective printing cylinder, a suction chamber enclosing said plurality of supporting rollers and having an open face engageable with the second side of said endless band, said suction chamber having opposed side walls and said shafts traversing said side walls, said suction chamber maintaining a pressure on the supported second side of the band less than the atmospheric pressure acting upon the other first side of the band, each of said side walls having displaceable wall portions with said shafts extending therethrough, each of said wall portions comprising plates in overlapping relationship with a fixed side wall of the suction chamber and at the locations of the extending shafts and capable of vertical displacement to maintain close contact between the open face of the suction chamber and the second side of the endless band when the support roller is displaced away from its respective printing cylinder to interrupt the printing of that cylinder upon the material supported upon the band.

4,256,038

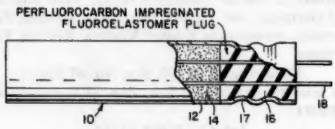
PERFLUOROCARBON VAPOR TAGGING OF BLASTING CAP DETONATORS

Russell N. Dietz, Shoreham, and Gunnar I. Senum, Patchogue, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 6, 1979, Ser. No. 9,623

Int. Cl.³ F42B *19/04*

U.S. Cl. 102—28 R **8 Claims**



1. In an explosive device comprising an electrical detonator having a shell containing detonating material, and means for sealing said shell, the improvement comprising:

a mass of material containing a perfluorocarbon which is released over a period of time as a vapor taggant from said mass.

4,256,039

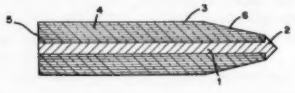
ARMOR-PIERCING PROJECTILE

John J. Gilman, Convent Station, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 2, 1979, Ser. No. 627

Int. Cl.³ F42B *11/14, 13/04, 15/26*

U.S. Cl. 102—52 **11 Claims**



1. An armor-piercing projectile comprising:

(a) an axial core;

(b) a continuous strip of metallic glass wound about said core, forming for the projectile a laminated body, a generally conical frontal surface, and a transverse rear surface; and

(c) bonding means for joining the adjacent laminated surfaces.

4,256,040

PROPORTIONAL CONTROLLER

Andrew M. Dieringer, Waterford, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jun. 15, 1978, Ser. No. 915,933

Int. Cl.³ E01B *29/24*

U.S. Cl. 104—17 R **8 Claims**

1. In a machine for driving spikes into railroad track, a frame with wheels adapted to engage the rails so that the frame can move along the track;

a movable carriage mounted on the frame;

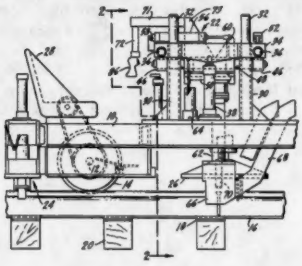
means for locating the carriage;

a spike driver attached to the carriage;

a control arm;

carriage control means mounted on the control arm for providing proportional control of the carriage position; and

a spike driver controller mounted on the control arm and including speed regulating means for providing proportional control of the speed of a drive stroke, and means for effecting a return stroke of the spike driver.

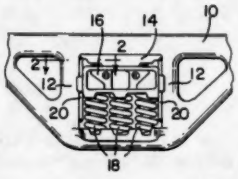


4,256,041

DAMPING RAILWAY TRUCK FRICTION SHOE

James M. Kemper, Park Forest, and Lynn K. Tilly, West Chicago, both of Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jul. 16, 1979, Ser. No. 57,746
Int. Cl.³ B61F *5/06, 5/12, 5/24*
U.S. Cl. 105—197 DB **2 Claims**



1. In a railway car truck comprising a side frame having substantially upright columns defining an opening, a bolster supported in said opening, friction surfaces provided on said upright columns, guiding surface means on said bolster, and friction shoe means disposed between said bolster and said column, said friction shoe means including a substantially vertical wall engageable with the friction surface on said upright columns, wherein the improvement comprises vertically convex wing surfaces on said friction shoe means engageable with the guiding surface on said bolster, and a vertical spring pocket and a spring within said pocket urging said wing surfaces into contact with the guiding surface of said bolster, said wing surfaces having a radius of curvature in a vertical plane, each of said wing surfaces engaging each guiding surface at a contact point, said contact point under normal level bolster operation being located substantially on the center line of said spring and substantially on the center line of said vertical wall, such that upon tilting of the bolster under operating conditions, contact is maintained between the bolster guiding surfaces and both shoe wing surfaces.

4,256,042

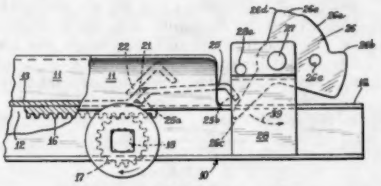
RAILWAY HOPPER CAR SLIDING GATE LOCK

Robert T. Fischer, Homewood, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

Filed Oct. 4, 1979, Ser. No. 81,763
Int. Cl.³ B61D *7/20, 7/22, 7/26*
U.S. Cl. 105—282 P **2 Claims**

1. A slide gate for a railway hopper car having a discharge opening, a slide gate door for said opening, a frame including generally horizontal support means upon which the door rides when moving between a first position at which it is below and closing said opening and a second position at which it is located at one side of said opening, means on said frame and engaging said door for moving said door between said positions, said door having an edge which leads the remainder of the door when the door is moving in the direction of the first to the second position, and means releasably engaging said door at said edge for preventing said edge and thus said door from moving in said direction from said first position, the last mentioned means being characterized by:

a spring plate having distal and proximal sides, said proximal side being affixed to said door at said edge, said distal side being in said direction from said proximal side and spaced a short distance above said support means; and



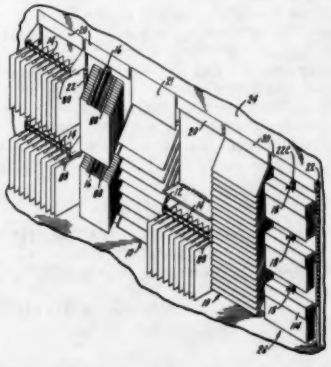
a cam pivotally secured to said frame for rotational movement about an axis, said axis being located at an elevation farther above said support means than is said plate, said cam having a cam face with a plurality of portions, with the door in the first position and in one rotational position of said cam one of said portions engaging said distal side and, in response to a force applied to said door in the sense of forcing said door in said direction, camming said distal side in the direction of said support means whereby the distal side of the plate acts as a cantilever spring resisting said force and with the cam blocks any significant movement of said door in said direction, and in another rotational position of said cam all of said portions being above said plate and door whereby they can be moved in said direction.

4,256,043

DISPLAY SYSTEM FOR SAMPLE ARTICLES

Ernest G. Ovitz, III, Galva, Ill., assignor to John H. Best & Sons, Inc., Galva, Ill.

Filed Jun. 14, 1979, Ser. No. 48,594
Int. Cl.³ A47B *41/04*
U.S. Cl. 108—29 **6 Claims**



1. A sample display system for displaying carpet wares, comprising:

a plurality of uprights adapted to be fastened to a wall, each upright having hook-receiving openings formed thereon;

a plurality of cantilever arms each having a hook at one end to be inserted into an opening in an upright to suspend the arm thereon, the arm extending outwardly from the wall and downwardly from the point where the hook is inserted in the opening, and each arm having a row of openings;

a plurality of carpet hangers each having a wire hook to be inserted in the opening of a cantilever arm, each wire hook supporting a clip having spaced leaf-spring flanges adapted to clamp the edge of a carpet sample;

a plurality of shelf frames each bent from a single piece of metal and comprising a pair of side arms joined by a front bar, said side arms and front bar each having flanges bent therefrom to support a shelf, and said side arms having ends terminating in hook brackets adapted to be hooked to openings in a selected pair of the uprights so that each shelf will project forwardly from the selected uprights and downwardly from the point where the hooks are inserted in the opening; and

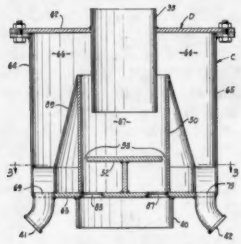
an elongated hanger rail with hook means at the ends thereof adapted to be hooked to selected uprights to extend horizontally therebetween.

4,256,044

AIR-FUEL MIXING DEVICE

Gordon D. Burton, Chagrin Falls, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Apr. 26, 1979, Ser. No. 33,691
Int. Cl.³ F23K *3/02*
U.S. Cl. 110—104 R **10 Claims**



1. An air-fuel mixing device for mixing solid pulverized fuel with air in preselected ratios prior to combustion comprising, an upstanding hollow tube forming an air-fuel mixing chamber, a table disposed in said tube intermediate the top and bottom ends thereof whereby at least some of the table edges are spaced from the walls of the tube to provide an air passageway therebetween, fuel feeding means for feeding pulverized fuel onto the table and off the edges thereof in preselected amounts, air feeding means for feeding pressurized air into the lower end of the tube and thence upwardly past the table edges whereby such upwardly flowing pressurized air catches the pulverized fuel overflow from the table and mixes therewith to form an air-fuel mixture, and tube outlet means for channelling the air-fuel mixture from the tube to associated fuel burners.

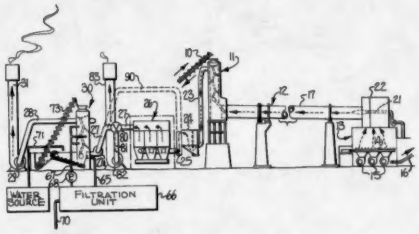
4,256,045

APPARATUS AND METHOD FOR TREATING A GAS WITH A LIQUID

Allen S. Johnson, Jr., Post Office Drawer 1037, Salisbury, N.C. 28144

Filed Jan. 16, 1980, Ser. No. 112,423
Int. Cl.³ F23J *11/00*
U.S. Cl. 110—345 **28 Claims**

15. A method of treating a flowing gas with a liquid to remove unwanted materials therefrom, said method comprising maintaining a mass of packing elements in the form of a relatively thin, generally vertically oriented layer extending along a predetermined zigzag path of travel defined by a pair of gas permeable retaining walls of nonlinear zigzag configuration extending generally vertically in opposing, spaced relation to one another, while directing a liquid onto the layer of packing elements, and while also directing a flowing gas upwardly along a predetermined sinuous path of travel repeatedly passing back and forth through the layer of packing elements successively from opposite sides thereof thus provide highly



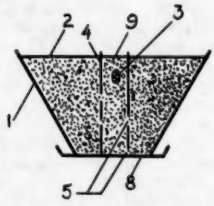
effective contact of the gas with the liquid, and at least periodically moving the layer of packing elements downwardly along the predetermined path of travel by discharging packing elements at the lower end of the path of travel, and replenishing the packing elements being discharged by directing additional packing elements into the upper end of the path of travel and into contact with the gas to thereby maintain the interstices between the packing elements free from clogging so as to achieve highly effective contact of the gas with the liquid.

4,256,046

PLANT CULTIVATION DEVICES AND METHODS

Lori Salvano, Hillside, N.J., assignor to Solomon Zaromb, Newark, N.J.

Filed Mar. 28, 1979, Ser. No. 24,869
Int. Cl.³ A01G *9/02*
U.S. Cl. 111—1 **9 Claims**



1. A plant-cultivation device comprising a sheet of material for forming a small enclosure within a portion of soil around a seed or young plant, said sheet being of sufficient stiffness and strength, and so shaped as to be adaptable:

(a) to being pushed into the soil around said seed or plant to a depth such as to effect retention of most of the nutrients within said enclosure while permitting drainage therefrom of any excess water; and

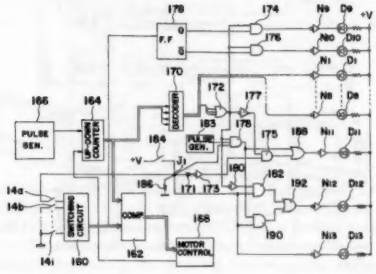
(b) to being subsequently withdrawn therefrom without significantly disturbing the soil around said seed or plant;

wherein said sheet is made of a substantially impervious material, and wherein said material has indentations along spaced and substantially parallel lines which permit breakage, cutting or tearing of said material along said indentations for the purpose of adjusting said sheet to an appropriate size.

4,256,047
ERROR INDICATION ARRANGEMENT FOR USE IN A SEWING MACHINE

Kazuo Suzuki, Higashiosaka; Hirokazu Koda, Gose; Kenichi Nakamura, Nara; Syuich Yoshikawa, Yamatokooriyama, and Naoki Ohara, Toyota, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Seiki Kabushiki Kaisha, Aichi, both of, Japan

Filed Jun. 13, 1979, Ser. No. 48,226
Claims priority, application Japan, Jun. 13, 1978, 53-71716
Int. Cl.[3] D05B *3/02*
U.S. Cl. 112—158 E **5 Claims**



1. A sewing machine having a plurality of switches for the selection of different sewing patterns, said sewing machine comprising:

means for detecting an erroneous operation in the selection of the switches; and

means for producing a warning signal when the detecting means detects the erroneous operation;

a plurality of individual pattern information carrying means;

a sewing information carrying means for controlling the sewing pitch in each stitch for producing an individual predetermined pattern of stitches with respect to each of the pattern information carrying means except particular pattern information carrying means; and

adjusting means for adjusting the use of said sewing pitch information carrying means, whereby said detecting means detects the use of said sewing pitch information carrying means when the particular information carrying means is selected.

4,256,048
KNIFE MECHANISM FOR TWIN NEEDLE SEWING APPARATUS

Wilhelm H. Jung, Mechanicsville, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 9, 1979, Ser. No. 82,821
Int. Cl.[3] D05B *65/02*
U.S. Cl. 112—292 **5 Claims**

1. Apparatus for use in a sewing machine having a pair of reciprocally driven sewing needles spaced apart from one another and a pair of bobbin/shuttle assemblies suitably positioned and spaced apart from one another for operatively cooperating with said pair of sewing needles during the sewing operation, comprising

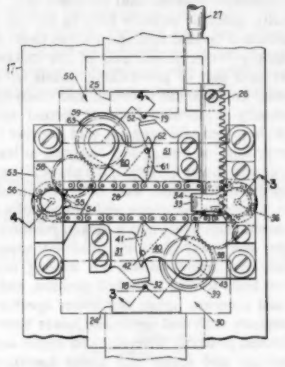
a throat plate disposed above said pair of bobbin/shuttle assemblies and having a pair of needle holes suitably located and spaced from one another to permit passage of said sewing needles through said throat plate during the sewing operation;

a pair of cutting mechanisms mounted on the bottom of said throat plate and being disposed in the space between said bobbin/shuttle assemblies;

said cutting mechanisms each being disposed adjacent a different one of said bobbin/shuttle assemblies for picking and cutting the threads of said adjacent bobbin/shuttle assembly and the sewing needle operatively cooperating therewith when operated;

each of said cutting mechanisms being provided with a fixed blade and a rotatable blade to be driven;

said fixed blade having a cutting edge disposed in spaced face to face relation with the adjacent bobbin/shuttle assembly;



said rotatable blade when driven picking threads of said adjacent bobbin/shuttle assembly and the sewing needle cooperative therewith and having a cutting edge cooperating with the cutting edge of said fixed blade to cut the picked threads;

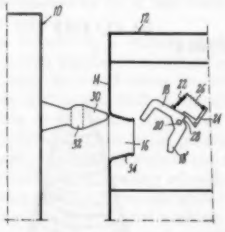
at least one of said cutting mechanisms being adapted to be operated at the end of a sewing operation; and

means operatively connecting said pair of cutting mechanisms together.

4,256,049
DEVICE FOR ASSEMBLING FLOATING BOX CAISSONS

Roger Brunet, La Seyne-Sur-Mer, and Gérard Marenco, Six-Fours-Les-Plages, both of France, assignors to Constructions Navales et Industrielles de la Mediterranee, La Seyne-sur-Mer, France

Filed Apr. 17, 1978, Ser. No. 897,161
Claims priority, application France, Apr. 27, 1977, 77 12714
Int. Cl.[3] B63B *3/02*
U.S. Cl. 114—77 R **5 Claims**



1. A system for coupling and locking a pair of floating box caissons, said system comprising:

a pair of pre-locking means, adapted to be positioned at corners of first and second caissons to be coupled and locked, for automatically achieving a first mutual engagement between said caissons when said caissons are moved toward each other, each said pre-locking means comprising:

a lock bolt extending outwardly from said first caisson, said lock bolt having therethrough a bore;

a casing on said second caisson, said casing having an

aperture positioned to confront said lock bolt when said caissons are moved together;

a hook pivotally mounted within said casing; and

control means, connected to said hook, for, upon said lock bolt being extended through said aperture, causing said hook to penetrate into said bore through said lock bolt and be locked therein, thereby causing said first mutual engagement between said caissons; and

manually operable positive locking means, adapted to be positioned on said first and second caissons at locations centrally between said pair of pre-locking means, for, after said pair of pre-locking means achieve said first mutual engagement between said caissons, achieving a manually removable locking second mutual engagement between said caissons, said positive locking means comprising, on one of said caissons, at least one pair of upper and lower locking bolts pivotally mounted about respective horizontal axes between an unlocked position whereat said upper and lower bolts are relatively adjacent each other and a locked position whereat said upper and lower bolts are relatively spaced from each other, and spring means for biasing said upper and lower bolts to said unlocked position, and on the other of said caissons, upper and lower apertures positioned to register with said upper and lower bolts when in said unlocked position, whereby said upper and lower bolts penetrate said upper and lower apertures when said caissons are moved together, a vertically extending control screw mounted within said other caisson, upper and lower locking blocks within said other caisson at positions to be contacted by said upper and lower bolts, respectively, when said upper and lower bolts are in said locked position, and upper and lower horizontally extending beams threaded onto said control screw, such that rotation of said control screw moves said upper and lower beams against the force of said spring means upwardly and downwardly, respectively, into contact with said upper and lower bolts, respectively, thereby moving said upper and lower bolts to said locked position and pressing said upper and lower bolts into engagement with said upper and lower locking blocks, respectively.

4,256,050

COLLAPSIBLE MARKER CONE

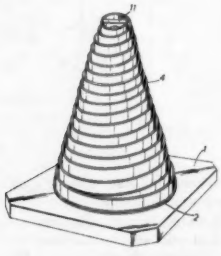
Bryon G. Barnard, London, England, assignor to National Research Development Corporation, London, England

Filed Aug. 22, 1979, Ser. No. 68,736

Claims priority, application United Kingdom, Aug. 29, 1978, 34846/78

Int. Cl.[3] **E01F** *9/01*

U.S. Cl. 116—63 C **15 Claims**



1. A collapsible conical element which comprises a base and a coiled strip the outer turn of which is restrained from pulling away from said base on extension of said coiled strip to form a cone, said strip having a plurality of projections including two projections disposed longitudinally on one face thereof and spaced from each other and an intermediate projection disposed longitudinally on the opposite face thereof so as to be at a height between the heights of said two spaced projections when the cone is in an upright position base down.

4,256,051

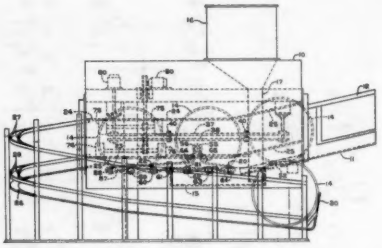
DUSTING APPARATUS

Clifford A. Landsness, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 6, 1979, Ser. No. 73,165

Int. Cl.[3] **B05C** *3/09, 11/02*

U.S. Cl. 118—107 **2 Claims**



1. A bead dusting apparatus for applying talc to circular bead rings, said apparatus having a housing for confining talc dusting powder, guideway means connected to said housing for feeding and discharging bead rings to and from said housing, two pairs of longitudinally spaced bead rollers in said housing operative to support a pair of spaced bead rings for rotation, guiderails located in said housing in alignment with said bead rollers and said guideway means to facilitate the movement of bead rings through said apparatus, drive means connected to said bead rollers to provide a positive drive for said bead rollers, a tank with dusting powder therein mounted in said housing and surrounding one pair of said bead rollers to dust bead rings as rotated by said one pair of rollers, brushes mounted in alignment with the other pair of said bead rollers operative to remove excess dust from said bead rings supported by said other pair of bead rollers, indexing means mounted in said housing and operative upon actuation to move bead rings from said one pair of bead rollers to said other pair of rollers and simultaneously operative to move bead rings from said other pair of rollers to said guideway means for discharging a bead ring therefrom, and actuating means mounted on said guideway means for actuating said indexing means in response to a bead ring on said guideway means for feeding bead rings to said housing.

4,256,052

TEMPERATURE GRADIENT MEANS IN REACTOR TUBE OF VAPOR DEPOSITION APPARATUS

Raymond V. Johnson, Tequesta, and Dennis P. Biondi, Palm Beach Gardens, both of Fla., assignors to RCA Corp., New York, N.Y.

Filed Oct. 2, 1979, Ser. No. 81,193

Int. Cl.[3] **C23C** *13/08;* **F27D** *15/02, 13/00;* **B05C** *5/00*

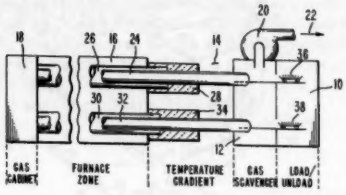
U.S. Cl. 118—719 **2 Claims**

1. In a furnace system for processing silicon-on sapphire devices having a cabin for storing and supplying gases and reactants used in the processing of SOS wafers, a furnace abutting said cabinet and having at least one refractory reaction tube extending therethrough, one end of said tube communicating with the cabinet for receiving the gases and reactants and the other end terminating in a scavenger chamber whereby to exhaust residual gases and reactants, the scavenger chamber being spaced from the furnace, and a loading-unloading chamber whereby SOS loaded boats may be handled for movement seriatim through the loading-unloading chamber, the scaven-

ger chamber, the refractory reaction tube extending between the spaced apart scavenger chamber and furnace, and into the furnace, the improvement comprising:

means providing a temperature gradient zone in said reaction tube extending between the scavenger chamber and the furnace;

said means including a refractory liner tube about the reaction tube and extending from the supply conduit to a predetermined intermediate section between the furnace and scavenger chamber; and



a tubular member of predetermined thermally insulative quality overlying said refractory liner and reaction tubes and extending from the furnace wall to a further predetermined intermediate reaction tube section;

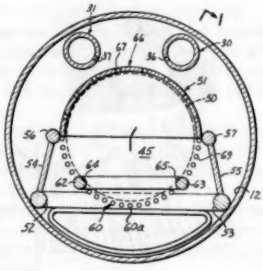
whereby, depending on process temperatures utilized, a predetermined temperature gradient is established in the reaction tube section outside of the furnace and whereby to inhibit the SOS wafers undergoing thermal shock.

4,256,053

CHEMICAL VAPOR REACTION SYSTEM

Alfred R. Dozier, 9332 Portsmouth Dr., Huntington Beach, Calif. 92646

Filed Aug. 17, 1979, Ser. No. 67,405
Int. Cl.[3] C23C *11/00;* **H01L** *21/68*
U.S. Cl. 118—728 **13 Claims**



1. A vacuum vapor deposition apparatus comprising:

a horizontally disposed vessel having an inside wall, a longitudinal extent thereof defining a deposition chamber, said vessel having a movable closure at one end thereof for loading and unloading;

at least one upstream vapor supply conduit extending along a first elevation in the vessel and being perforated coextensively with the deposition chamber;

means disposed at a second elevation in the vessel and coextensively aligned with the perforated portion of the supply conduit and supporting spaced substrates arranged in a stack along a longitudinal extent of said deposition chamber;

said means including a continuous skirt portion conforming generally at a first one of its ends to the periphery of said stack at a location spaced from said inside wall and at its other end conforming to said inside wall:

an arcuate vapor distributor conforming generally to the upstream portion of said stack, perforated coextensively with its longitudinal extent, and continously operatively associated with said first end of the skirt; and

exhaust means including an exhaust region immediately downstream from said stack encompassing the entire lateral-to-flow cross section of the downstream side of the skirt, and an exhaust conduit conveying vapor from said exhaust region to the outside of the vessel;

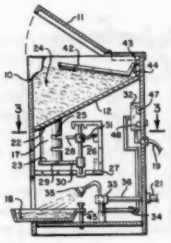
whereby vapor supplied through said perforated conduit and passing through said distributor is constrained to pass between the spaced substrates to effect said deposition and to exit through said exhaust region and exhaust conduit.

4,256,054

PET FEEDER

Kenneth H. Hitchcock, Rte. 1 Box 169H, Paso Robles, Calif. 93446

Filed Oct. 10, 1979, Ser. No. 83,291
Int. Cl.[3] A01K *5/02*
U.S. Cl. 119—51.11 **8 Claims**



1. A pet feeder including, in combination:

(a) a cabinet having a top lid and a sloping partition dividing the interior of the cabinet into an upper bin and lower chamber, the lower central portion of said partition having an oblique opening, and the lower front wall of said cabinet having a food tray opening:

(b) a vertical food metering cylinder having open upper and lower ends, the upper end being secured to the underside of said partition and cut at a bias to register with said oblique opening so that food placed in said bin by raising said lid fills said cylinder through its upper end opening, said cylinder having at least two vertically spaced circumferential slots intermediate its upper and lower ends each extending over at least 180°;

(c) chopper means comprising a vertical shaft rotatably mounted in the interior portion of said chamber adjacent to said cylinder, and upper and lower circumferentially spaced paddles secured to said shaft at vertically spaced points such that the lower paddle covers said lower end opening of said cylinder and said upper paddle lies in the plane of one of said circmferential slots to one side of said cylinder, the circumferential spacing of said upper and lower paddles being such that when said shaft and paddles are rotated from a first to a second position, the lower paddle is swung out from under said cylinder and the upper paddle is swung into said one slot so that food filling said cylinder has a first measured amount chopped off by said upper paddle to fall through the lower end opening of said cylinder, said upper paddle preventing further food in said bin from falling through said cylinder, the securement point of said upper paddle to said shaft being releasable to enable vertical shifting thereof so that said upper paddle can be secured at a level to be received in the other of said two slots when moved from said first to said second position whereby a second different measured amount of food can be metered from said cylinder to fall through the lower end opening of said cylinder;

(d) a food tray extending from the exterior of said cabinet partially within said food tray opening to underlie the lower end of said cylinder;
(e) an electrically operable solenoid connected to move said shaft and paddles from said first to said second position when energized;
(f) spring means for rotating said shaft and paddles together back to said first position from said second position when said solenoid is de-energized; and
(g) timer means connected to said solenoid to energize said solenoid for a given period of time at desired set time intervals

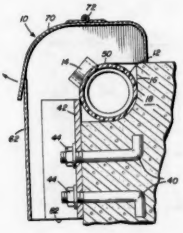
whereby a pet will have food available in said food tray for eating at said time intervals.

4,256,055

MILK VALVE COVER GUARD

Ralph L. Schlatter, Rte. 3, Box 2008, Paulding, Ohio 45879

Filed Sep. 13, 1979, Ser. No. 75,507
Int. Cl.[3] A01K *1/12*
U.S. Cl. 119—14.03 **4 Claims**



1. In a milking machine low line assembly including a curb mounting a milk line and a milk valve connected to said line, the improvement comprising; a milk valve cover guard connected to said curb in surrounding, spaced relation to said valve, said cover guard including a hinged lid section for disposition in an open position to allow access to said valve and a closed position to prevent access to said valve, said milk valve cover guard also including a depending chute area having an open bottom for discharging cleaning fluid dispensed at said valve, said cover guard further including a pair of curved side panels spaced one on each side of said milk valve and extending vertically along a portion of the side of said curb and horizontally along a portion of the top of said curb and further including a front panel extending between said side panels, said hinged lid section being connected between the horizontal portions of said side panels for pivotal movement between a closed position and an open position.

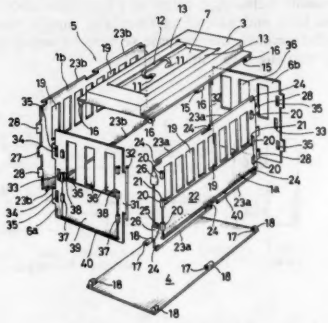
4,256,056

PORTABLE CASE FOR CARRYING SMALL ANIMAL

Teho Sou, 7-18 Higashiimazato 2-chome, Higashinari-ku, Osaka, Japan

Filed May 17, 1979, Ser. No. 39,848
Claims priority, application Japan, Mar. 17, 1979, 54-34555
Int. Cl.[3] A01K *1/02, 1/03*
U.S. Cl. 119—19 **12 Claims**

1. A portable case for carrying a small animal, which comprises a case body and two door leaves; said case body being composed of two side wall boards opposing each other, one top board being mounted hinge-jointedly on the upper end faces of said side wall boards, and one bottom board being attached likewise hinge-jointedly to the lower end faces of said wall boards; said side wall boards being formed at their upper and lower end faces with elongate rods integrally, end portions of said upper and lower faces of each side wall board being cut away so that end portions of said rods protrude to define pivot pins; said top board and said bottom board being provided integrally with cooperating pivot bearings whereby said side wall boards, said top board and said bottom board are all connected hinge-jointedly by inserting said pivot pins into said pivot bearings; said case body thus having openings at its front and rear side and becoming foldable; said door leaves covering



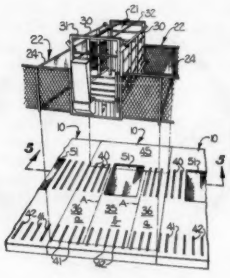
said openings and pivoting severally their own one sides on end faces of ones of said boards thereby to be foldable back onto the outer surface of said ones of said boards; the other side of said door leaves being free to be engaged and disengaged with and from the other end faces of said boards.

4,256,057

GANG SLAT FOR FLOORING OF AN ANIMAL SHELTER AND HAVING A WASTE-PASSAGE GRATE

William T. Herring, P. O. Box 181, Newton Grove, N.C. 28366

Filed Sep. 27, 1979, Ser. No. 79,484
Int. Cl.[3] A01K *1/015, 1/02*
U.S. Cl. 119—28 **14 Claims**



1. A gang slat for use as a floor section in an animal shelter for newborn pigs and adapted to underlie and support a farrowing crate having a central pen for confining a sow therein and side pens extending along opposite sides of the central pen for confining a newborn liter of pigs in close proximity to the sow, said gang slat comprising

a central section formed from reinforced concrete and having a front portion and a rear portion adapted for supporting thereon respective front and rear portions of the sow in the central pen,

opposing side sections also formed from reinforced concrete and integrally with said central section, said side sections extending along opposite sides of said central section and being adapted to support the litter in the side pens, and said side sections having a plurality of openings therein for passage therethrough of waste from the litter of pigs,

said rear portion of said central section of the gang slat

having a relatively large opening therein which constitutes at least a substantial portion of said rear portion,

shoulder means at least partially defining the perimeter of said large opening and being recessed relative to the upper surface of the gang slat,

grate means carried by said rear portion of the gang slat central section and positioned in said opening and engagingly supported upon said recessed shoulder means with the upper surface of said grate means being positioned no higher than the upper surface of the gang slat,

the openings in said grate means being sufficiently small so as to permit the litter of pigs to be born thereon and walk thereon without injury as by their feet being caught in the openings and wherein the openings are of sufficient size and number for readily permitting the sow's and the newborn pigs' waste to pass therethrough, and

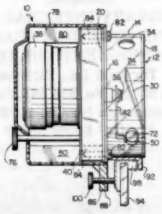
fastening means for securing said grate means within said opening.

4,256,058

AUTOMATIC AQUATIC FOOD DISPENSER

Thomas A. Deakins, Star Rte., Sequatchie, Tenn. 37374

Filed Aug. 31, 1978, Ser. No. 938,701
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51.11 **3 Claims**



1. A dispenser for granular food comprising:

a food storage bin comprising a cylinder having a front face and back plate, said bin having a first opening for inputting of food for temporary storage, and a second opening on the front face thereof for the discharge of food from said dispenser;

a cup, said cup movable within said food storage bin for collecting a portion of said food stored in said bin, conveying said collected food and discharging said collected food to said second opening;

means for attachment of said dispenser to an aquarium, said attachment means locating said second opening such that food dispensed from said second opening falls into said aquarium; and

an electric motor operating at constant speed for moving said cup, whereby food is collected, conveyed and discharged at uniformly timed intervals by the circular motion of said cup wherein said cup includes a rotatable screw threaded through the closed end of said cup, the head of said screw being within said cup, whereby the internal capacity of said cup is varied by rotating said screw,

wherein said moving cup is connected to an arm which is connected to the output of said motor providing circular motion for said cup; and

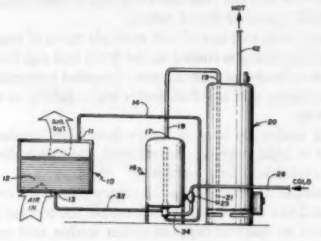
said second opening is of a quadrilateral shape having unequal edges and wherein connected panels within said food storage bin attach to three edges of said quadrilateral opening, said unattached edge of said opening being the upper most edge, whereby access for discharge of food through said second opening is from above said second opening.

4,256,059

HEAT-EXCHANGING SYSTEM

Mervin A. Roggow, Carlos, and J. Harold Stiver, Alexandria, both of Minn., assignors to Energy Concerns, Inc., Alexandria, Minn.

Filed May 10, 1979, Ser. No. 37,663
Int. Cl.³ F22B *1/02*; F25B *27/02*
U.S. Cl. 122—32 **8 Claims**



1. A heat-exchanging system comprising:

(a) a water tank having a cold water outlet adjacent its lower end and a warm water outlet adjacent its upper end;

(b) an upright conduit mounted within said tank and extending upwardly therewithin;

(c) a second conduit of smaller radius than said first mentioned conduit extending upwardly therewithin and being joined together adjacent its upper end in fluid sealed relation and defining an annular fluid chamber having a closer upper end therebetween;

(d) said second mentioned conduit having an open upper end and having a cold water inlet at the lower end portion thereof;

(e) said first mentioned conduit having a fluid discharge port formed therein adjacent its lower end portion and being otherwise closed around said second mentioned conduit;

(f) a third conduit of smaller diameter than said second mentioned conduit and extending upwardly therewithin and being connected in fluid-communicating relation with said fluid chamber adjacent the upper end of the latter;

(g) said third mentioned conduit being constructed and arranged to receive and conduct relatively hot fluid upwardly therethrough in heat-exchanging relationship with a flow of water passing through said chamber in heat-exchange relationship with such water and thence through said discharge port of said first mentioned conduit; and

(h) a conduit connecting said cold water outlet of said water tank with said cold water inlet of said second mentioned conduit in free fluid-transmitting relation;

(i) said last mentioned conduit being constructed and arranged to be at all times connected to a pressurized cold water supply in cold-water receiving relation.

4,256,060

MANIFOLD HYDROGEN GENERATOR UNITS FOR AUTOMOTIVE I.C. ENGINES

Donald A. Kelly, 58-06 69th Pl., Maspeth, New York, N.Y. 11378

Filed Aug. 13, 1979, Ser. No. 66,243
Int. Cl.³ F02B *43/08*
U.S. Cl. 123—3 **10 Claims**

1. A manifold hydrogen generator unit for automotive I.C. engines comprised of a cylindrical iron reactor indirectly attached to the existing exhaust manifold of automotive I.C. engines,

adapter mounting means permanently fastened to said cylindrical iron reactor and adjustable clamping means for said adapter mounting means on to said existing exhaust manifold,

two nearly identical front and rear end caps threaded on to said cylindrical iron reactor,

multiple turns of small diameter metal tubing closely wound longitudinally around and in full contact with said adapter mounting means and said existing exhaust manifold,

plastic water reservoirs uniformly disposed in a raised position above the engine compartment of a motor vehicle,

plastic tubing connection means between said plastic water reservoirs and the rear entrance end of said multiple turns of small diameter metal tubing,

the front steam exit end of said multiple turns of small diameter metal tubing is routed to the front end cap threaded on to said cylindrical iron reactor, threaded connector means for securing said small diameter metal tubing to said front end cap,

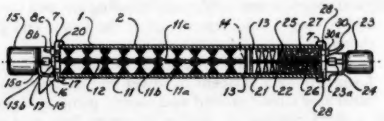
mutliple uniformly spaced rotary iron wire brushes closely fitted in light rubbing contact with the inside diameter of said cylindrical iron reactor,

said multiple uniformly spaced rotary iron wire brushes all secured to a front central shaft supported by said front end cap and an internal support spider within said cylindrical iron reactor, low friction bearing means centrally disposed within said fron end cap and said internal support spider for said front central shaft,

two identical hub discs hold each of said rotary iron wire brushes in a uniformly dense radial pattern,

a major threaded portion disposed on said front central shaft for the securing of each said multiple uniformly spaced rotary iron wire brushes, twin locknuts disposed on either side of each of said two identical hub discs,

a small D.C. electric motor disposed at the front of said front end cap connected to said front central shaft by means of



a locking coupling, a mounting bracket for securing said small D.C. electric motor to said front end cap, standard hardware means for fastening said mounting bracket and said small D.C. electric motor,

an air inlet port axially disposed within said front end cap, a rectangular air scoop located over said air inlet port and secured to said front end cap by means of standard hardware through flanges on said rectangular air scoop,

a pivoting metal flap covering said air inlet port disposed in normally closed position over said air inlet port, an arm on said pivoting metal flap connected to an arm on a central friction clutch,

spring means on said arms to maintain said pivoting metal flat in a normally closed position over said air inlet port,

said central friction clutch disposed over and in rotational friction contact with said front central shaft,

a small diameter metal tubing connection disposed between the rear upper portion of said existing manifold, and said front end cap, threaded connection means at both ends of said small diameter metal tubing connection,

multiple conveyor fans uniformly disposed within said cylindrical iron reactor reactor directly behind said internal support spider, said multiple conveyor fans fastened to a rear central shaft which protrudes through said rear end cap,

a small D.C. electric motor disposed behind said rear end cap and connected to said rear central shaft by means of a locking coupling, a mounting bracket for securing said small D.C. electric motor to said rear end cap, standard hardware means for fastening said mounting bracket and said small D.C. electric motor,

said rear central shaft is supported by low friction bearings within said rear end cap and a second internal support spider within said cylindrical iron reactor,

a medium mesh disc screen disposed behind the rear most said conveyor fan, a central clearance hole within said medium mesh disc screen to clear said rear central shaft,

a hollow clearance tube centrally located over said rear central shaft and secured to the inside face of said rear end cap, said medium mesh disc screen is secured to the front end of said hollow clearance tube,

a fine mesh steel wool pack is placed in the rear compartment formed by the medium mesh disc screen within the cylindrical iron reactor and the inside face of said rear end cap,

an exit port axially disposed within said rear end cap connected by a metal tubing line on the intake manifold of said automotive I.C. engine, threaded connection means at both ends of said metal tubing line,

multiple resistance electrical heaters with threaded bases uniformly disposed and secured into said cylindrical iron reactor, all of said multiple resistance electrical heaters are connected to a second electrical storage battery within the automotive vehicle,

several electrical generating means are included within the automotive vehicle as a recharging means for said second electrical storage battery.

4,256,061

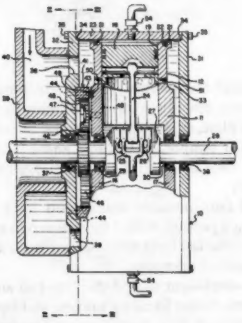
TWO CYCLE ROTARY INTERNAL COMBUSTION ENGINE AND CYLINDER SEALING RING ARRANGEMENT THEREFOR

Cleto L. Lappa, 541 Torwood Ln., Pittsburgh, Pa. 15236

Continuation-in-part of Ser. No. 838,383, Sep. 30, 1977, Pat. No. 4,136,646. This application Nov. 8, 1978, Ser. No. 958,637

Int. Cl.[3] F02B 57/08

U.S. Cl. 123—44 D **7 Claims**



1. A two-cycle internal combustion engine having a rotary cylinder block comprising a plurality of radially arranged angularly spaced cylinders supported at their outer extremities by an annular rim member, each cylinder having a bore opening at its outer end and having a piston reciprocable therein, said pistons being connected to a common crank arm of a crankshaft, a circular housing within which said rotary cylinder block rotates, said housing having a series of exhaust ports and fuel injectors arranged circumferentially in angularly spaced relation with which said open-ended bores sequentially register, wherein the improvement comprises means providing a sealed contact between each cylinder and said circular housing, said means including a split sealing ring having overlapping ends, and an annular groove in said annular rim in concentric surrounding relation to the open end of the bore of each of said cylinders in which said split sealing ring is disposed, said groove varying in depth circumferentially and said ring varying in height circumferentially so as to conform in contour to the circular interior surface of said circular housing, the pe-

ripheral outer surface of each of said split sealing rings sloping at a steep angle, in the range of 75°–85° to the base, and the outer wall of said groove most remote from the cylinder bore sloping correspondingly, whereby a component of the force exerted on said ring in said groove due to cylinder gas pressure at least partially counteracts the effect of centrifugal force acting to press said ring to the contact surface on said circular housing.

4,256,062

INTERNAL COMBUSTION DIESEL ENGINE

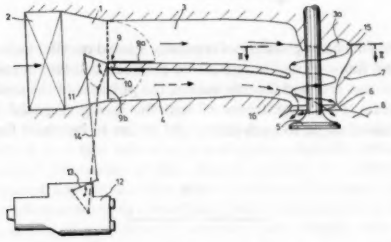
Hans-Jürgen Schäfer, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 3,999

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803533

Int. Cl.³ F02B *3/06, 31/00*

U.S. Cl. 123—52 M **6 Claims**



1. In an internal combustion diesel engine having at least one cylinder having a combustion chamber, a fuel injection means for injecting fuel directly into the combustion chamber of each said cylinder, each said combustion chamber having a first air-only intake duct means for supplying air to said combustion chamber for combining and mixing with said fuel only in said combustion chamber, wherein said first duct means is designed as a swirl duct, the improvement comprising a second air-only intake duct means associated with each said combustion chamber and connected in parallel with said first duct means, for supplying an increasing quantity of substantially swirl-free air to said combustion chamber in response to increasing engine speed, said swirl-free air combining and mixing with said fuel also only in said combustion chamber.

4,256,063

INTAKE SYSTEM OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Masaharu Sumiyoshi; Setsuro Sekiya, and Katsuhiko Motosugi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 21, 1979, Ser. No. 22,481

Claims priority, application Japan, Apr. 21, 1978, 53-46700

Int. Cl.³ F02B *15/00*

U.S. Cl. 123—52 M **20 Claims**

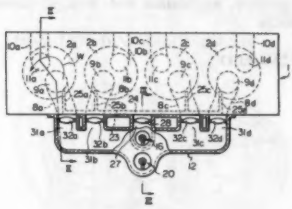
1. A multi-cylinder internal combustion engine having a plurality of cylinders, each having a combustion chamber and an intake valve, said engine comprising:

a main intake passage common to at least two cylinders and comprising an inlet and at least two main branch intake passages branched off from said main intake passage, each of said main branch intake passages being connected to the respective combustion chamber via the corresponding intake valve;

main fuel supply means arranged in the inlet of said main intake passage;

an auxiliary intake passage common to said two cylinders and comprising an inlet and at least two auxiliary branch intake passages branched off from said auxiliary intake passage, each of said auxiliary branch intake passages having an outlet which opens into the respective main branch passage at a place near the valve gap formed between the corresponding intake valve and a valve seat thereof when the intake valve is open, the outlet being directed in the circumferential direction of the corresponding combustion chamber;

auxiliary fuel supply means arranged in the inlet of said auxiliary intake passage;



primary valve means arranged in said auxiliary intake passage and opened in accordance with increase in level of the load of an engine; and

secondary valve means arranged in said main branch intake passages and operatively connected to said primary valve means for opening said secondary valve means after the opening degree of said primary valve means is increased beyond a predetermined opening degree.

4,256,064

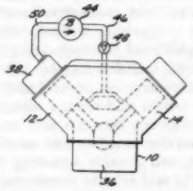
FUEL CONSERVING ENGINE IMPROVEMENT

Joseph R. Thorn, 6152 Turnergrove Dr., Lakewood, Calif. 90713

Filed Apr. 4, 1980, Ser. No. 137,389

Int. Cl.³ F02B *75/20*

U.S. Cl. 123—59 EC **8 Claims**



1. In a four-stroke cycle internal combustion engine including at least a pair of complemental first and second cylinders within which first and second pistons, respectively, reciprocate in unison in the same direction on different strokes, and further including means defining a crankcase gas collection area in communication with a crankcase adjacent said first and second cylinders, the fuel conserving engine improvement comprising:

conduit means providing fluid communication between said first and second cylinders through openings uncovered by said first and second pistons at the bottom of their intake and power strokes, respectively, whereby exhaust gases in said second cylinder can flow into said first cylinder; and

blower means in fluid communication with said crankcase gas collection area and including a blower operative to discharge crankcase gases downstream into said conduit means whereby any lubricating oil and exhaust gases tending to collect in said conduit means are circulated toward said crankcase upon uncovering of said openings subsequent upward movement of said first and second pistons on their compression and exhaust strokes, respectively, said blower means including check valve means

preventing upstream gas flow from said conduit means to said blower.

4,256,065

ARRANGEMENT FOR THE CONTROLLABLE OPERATION OF VALVES

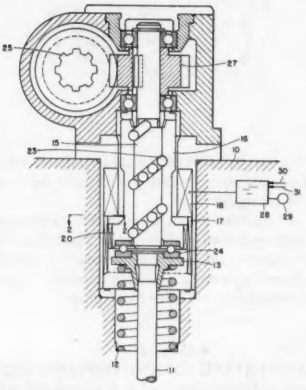
Dieter Hirt, Augsburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,212

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754624

Int. Cl.³ F16K *31/10;* **F01L** *1/00*

U.S. Cl. 123—90.11 **8 Claims**



1. An arrangement for the controllable operation of a valve, comprising mechanically cooperating first and second rotatable members which are movably coupled to each other and are disposed in a relative concentric arrangement, said first rotatable member comprising a shaft, said second member being a hollow cylindrical ball-supporting rolling spindle encompassing said shaft, said first member being driven by external energy, an electromagnetic control means for generating a magnetic field to which said second member is subjected to effect relative movement between said members to cause a force-locked connection coupling said members to effect actuation of the valve, and a valve actuating member being displaced responsive to said relative movement between said first and second members.

4,256,066

CARBURETTOR

Max Y. A. M. Serruys, 123/545, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

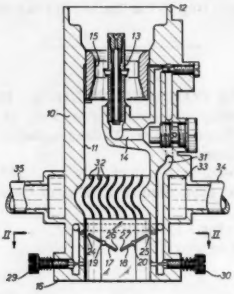
Continuation of Ser. No. 640,923, Dec. 15, 1975, abandoned. This application Jul. 6, 1979, Ser. No. 55,747

Claims priority, application France, Dec. 27, 1974, 74 42953

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—545 **1 Claim**

1. A carburettor comprising a conduit, an air intake and throttle means disposed in respective upstream and downstream positions in said conduit in relation to the flow of air and fuel therein, fuel introduction means adapted to provide a uniform transverse distribution of fuel droplets in said conduit, said fuel introduction means including a conical needle controlling admission of fuel into the air flow through the air intake and mounted on a piston which is disposed transversely of the conduit and is acted upon by the depression in the conduit to admit more fuel when the depression is greater and less fuel when the depression is less, said conduit having a substantially constant cross section from said fuel introduction means to said throttle means, said conduit having an elbow therein between said fuel introduction means and said throttle means, all the air passing through said elbow in all positions of said



throttle means, a plurality of regularly spaced parallel incurved heating fins disposed in said elbow between said fuel introduction means and said throttle means, the portions of the conduit upstream and downstream of said fins being disposed at a substantial angle to each other, and means to heat said fins.

4,256,067

OBLONG PISTON RINGS FOR INTERNAL COMBUSTION ENGINE

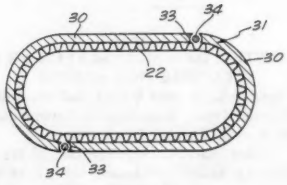
Takeo Fukui, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1979, Ser. No. 26,667

Claims priority, application Japan, Apr. 7, 1978, 53/44865[U]; Jun. 21, 1978, 53/84036**[U]**

Int. Cl.³ F02F *3/00;* **F16J** *1/02;* **F02F** *5/00*

U.S. Cl. 123—193 P **4 Claims**



1. For use in an internal combustion engine having an oblong piston mounted to reciprocate within an oblong cylinder, the piston having a peripheral groove and the cylinder having arcuate end portions, the improvement comprising:

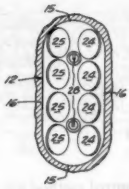
a split piston ring adapted to be received within the peripheral groove and having curved end sections which form part of a circle in cross section and substantially straight side sections, said split piston ring being oblong and having an outer surface shaped for sliding contact with the oblong cylinder, the split piston ring including two duplicate segments each integrally comprising one of said curved end sections and one of said side sections forming substantially a J-shape.

4,256,068

OBLONG PISTON AND CYLINDER FOR INTERNAL COMBUSTION ENGINE

Shoichiro Irimajiri, Kawagoe, and Takeo Fukui, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 022,942, Mar. 22, 1979, abandoned. This application Nov. 6, 1979, Ser. No. 91,837
Claims priority, application Japan, Mar. 28, 1978, 53-34842
Int. Cl.[3] F02F *3/28;* F02B *15/00;* F02P *15/02*
U.S. Cl. 123—193 P 9 Claims



1. In an internal combustion engine, the combination of: stationary walls forming an oblong cylinder, an oblong piston slidably mounted to reciprocate in sliding contact within said cylinder, said walls and piston cooperating to form a combustion chamber, a series of more than two intake valves positioned on a first side of a central plane extending through the longest dimension of said oblong cylinder in a substantially straight line on said first side of and parallel to said plane, a series of more than two exhaust valves positioned on the second side of said plane in a substantially straight line on said second side of and parallel to said plane, each of said valves having a valve head positioned in said combustion chamber and having a valve stem slidably mounted in said stationary walls, and a crankshaft, said crankshaft being parallel to said central plane.

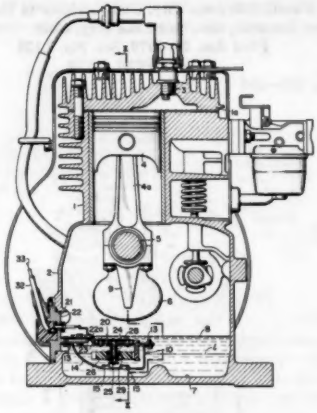
4,256,069

LUBRICANT OIL LEVEL DETECTING DEVICE FOR INTERNAL COMBUSTION ENGINES

Yutaka Masuda, Iwata, and Seisaku Ota, Hamakita, both of Japan, assignors to Yamaha Hatsudori Kabushiri Kaisha, Tokyo, Japan

Filed Feb. 27, 1979, Ser. No. 15,622
Claims priority, application Japan, Feb. 28, 1978, 53-22211; Feb. 28, 1978, 53-25107[U]; Feb. 28, 1978, 53-25108[U]; Mar. 29, 1978, 53-41417[U]
Int. Cl.[3] F01M *1/00*
U.S. Cl. 123—196 S 6 Claims

1. Internal combustion engine comprising cylinder means, piston means disposed in said cylinder means for reciprocating movement therein, crankcase means defining crankchamber means beneath the cylinder means and having lubricant oil sump means defined therein, crankshaft means disposed in said crankchamber means and connected with said piston means through connecting rod means, oil splashing means movable with said crankshaft means along a path for splashing lubricant oil in said sump means toward said cylinder means, lubricant oil level detecting means including detecting switch means disposed in said sump means so that it is actuated when amount of the lubricant oil is decreased beyond a predetermined level, shield means provided in said sump means at least between the path of the splashing means and the detecting switch means to divide the sump into sections which are communicated with each other at a level below the detecting means, said shield means comprising cover means encircling side and bottom



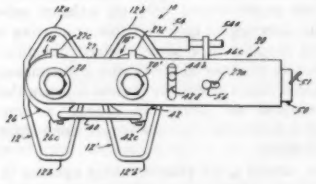
portions of the detecting switch means and provided with communication passage means.

4,256,070

VALVE DISABLER WITH IMPROVED ACTUATOR

Robert S. Mueller, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1978, Ser. No. 929,159
Int. Cl.[3] F02D *13/06*
U.S. Cl. 123—198 F 16 Claims



1. In an apparatus adapted to enable and at least partially disable a mechanism normally operated by cyclically applied forces, said apparatus including means movable between two positions for enabling and disabling the normal operation of said mechanism, the improvement of said apparatus comprising;

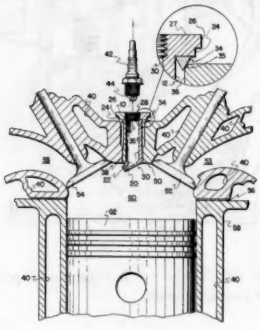
actuation means shiftable between first and second positions, said actuation means operative when in one of said first and second positions to apply a portion of said cyclically applied forces to said movable means for moving said movable means from one of said two positions to the other of said two positions.

4,256,071

TORCH CHAMBER APPARATUS AND METHOD FOR A SPARK PLUG OF AN INTERNAL COMBUSTION ENGINE

Don C. Casull, Salt Lake City, Utah, assignor to Deseret Automotive Research, Inc., Salt Lake City, Utah

Filed Jan. 29, 1979, Ser. No. 7,128
Int. Cl.[3] F02B 19/18
U.S. Cl. 123—266 2 Claims



1. A torch chamber for a combustion chamber of a cylinder of an internal combustion engine, the combustion chamber including intake valve means and exhaust valve means comprising:

a hollow, cylindrical body having a first, closed end and a second, closed end, the hollow body forming an ignition chamber;

a single jet nozzle in the first end, the jet nozzle being oriented downwardly at an angle of about 45° from the axis of the hollow, cylindrical body and thereby providing a passageway through the first end;

alignment means on the body for orienting the jet nozzle at an acute angle toward only the exhaust valve means thereby directing an ignition flame originating inside the ignition chamber in a predetermined direction into the combustion chamber at the exhaust valve means;

a first thread means exteriorily formed adjacent the first end and adapted to threadedly engage a conventional threaded, first spark plug-receiving opening into a combustion chamber;

a coaxial, second spark plug-receiving opening in the second, closed end, the opening having thread means interiorily formed therein and adapted to threadedly engage a spark plug;

an annular shoulder circumscribing the cylindrical body adjacent the second end and having a diameter incrementally greater than a rim of an access port to the threaded spark plug-receiving opening in the combustion chamber;

deformable gasket means for placement between the rim and the annular shoulder to accommodate deformation upon tightening of the first thread means in the first spark plug-receiving opening; and

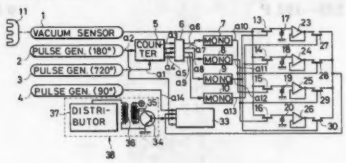
wrench engagement means adjacent the second end to accommodate tightening the first thread means in the first spark plug-receiving opening and cause deformation of the deformable gasket means.

4,256,072

SPARK TIMING CONTROL METHOD AND DEVICE

Takayoshi Nakatomi, and Keiji Aoki, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 21, 1978, Ser. No. 926,728
Claims priority, application Japan, Jul. 22, 1977, 52-87346
Int. Cl.[3] F02P 5/04
U.S. Cl. 123—415 13 Claims



1. A spark timing control method for an automobile internal combustion engine having an intake manifold and a plurality of cylinders as well as a crank shaft, comprising the steps of:

storing or delaying, an intake vacuum manifold signal on an intake stroke of a specific cylinder of the engine;

delivering to a computing unit the intake manifold vacûum signal;

delivering a rotational speed signal to the computing unit;

computing a spark advance angle for the specific cylinder with the computing unit,

setting a spark advance angle for said specific cylinder;

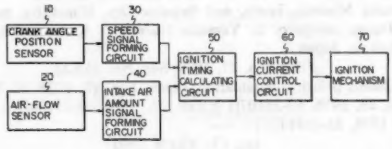
the step of storing or delaying occuring at least for the time till the computing unit computes the spark advance angle for the specific cylinder.

4,256,073

METHOD OF CONTROLLING IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Mamoru Kobashi, and Toshihisa Ogawa, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 4, 1979, Ser. No. 81,795
Claims priority, application Japan, Oct. 9, 1979, 53/123572
Int. Cl.[3] F02P 5/04
U.S. Cl. 123—422 6 Claims



1. A method of controlling ignition timing of an internal combustion engine, having an ignition system, comprising the steps of:

generating at least one electrical signal being indicative of an operating condition of said engine;

calculating the spark-advance angle in said engine based on said generated electrical signal;

determining a lower limit of a required spark-advance angle;

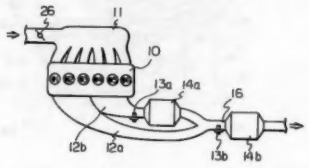
comparing the value of said calculated spark-advance angle with said lower limit, and it said calculated spark-advance angle is less than said lower limit, correcting said calculated spark-advance angle so that it coincides with said lower limit, and; then,

controlling the ignition timing of said ignition system in accordance with said calculated spark-advance angle.

4,256,074
CONTROL SYSTEM FOR CLOSED LOOP MIXTURE CORRECTION AND SPLIT ENGINE OPERATION

Fukashi Sugasawa, and Yukihiro Etoh, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 7, 1979, Ser. No. 46,309
Claims priority, application Japan, Jun. 16, 1978, 53-72849
Int. Cl.³ F01N *3/15*
U.S. Cl. 123—440 **4 Claims**



1. A control system for an internal combustion engine having first and second cylinder groupings, comprising:

split engine control means for operating said engine on full cylinders in which said first and second cylinder groupings are activated to give higher engine power when the magnitude of engine load is above a predetermined value or operating said engine on less than full cylinders in which only said second cylinder grouping is activated to give a lower engine power when the engine load magnitude is below said predetermined value;

first and second exhaust conduits for passing exhaust gases from said first and second cylinder groupings, respectively, to a common junction;

a common exhaust conduit connected to said common junction for passing exhaust gases therethrough to the atmosphere;

a first exhaust gas sensor and a first catalytic converter disposed in said second exhaust conduit;

a second exhaust gas sensor and a second catalytic converter disposed in said common conduit; and

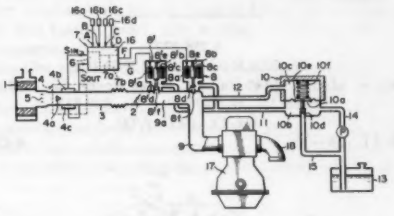
feedback control means selectively responsive to a signal from said first exhaust gas sensor when said engine is operated on partial cylinder for correcting the air-fuel ratio of mixture supplied to said second cylinder grouping to a desired value or responsive to a signal from said second exhaust gas sensor when said engine is operated on full cylinders for correcting the air-fuel ratio of mixture supplied to both said first and second cylinder groupings to said desired value.

4,256,075
FUEL FEED DEVICE FOR ENGINE

Toyoaki Fukui, Katsuragoshomachi; Tatsuro Nakagami, Kyoto; Norio Endo, Kameoka; Takao Miki, Himeji, and Takashi Ishida, Oimachi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; Mitsubishi Denki Kabushiki Kaisha and Mikuni Kogyo Kabushiki Kaisha, all of Tokyo, Japan

Filed Jul. 11, 1979, Ser. No. 56,514
Claims priority, application Japan, Jul. 13, 1978, 53-85356
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—478 **13 Claims**

1. A fuel feed device for an engine having an intake passage, comprising an air flow rate detecting means in said intake passage for generating electric signals of frequencies proportional to the suction air flow rate; a plurality of electromagnetic valve means for supplying fuel to said intake passage downstream of said air flow rate detecting means; and means for supplying fuel to said electromagnetic valves includes fuel pressure regulator means for maintaining a fixed pressure differential between the fuel feed pressure to said electromagnetic valves and the suction pressure in said intake passage near the fuel inlet thereto; said plurality of electromagnetic valve means having fuel passages of different cross sectional areas; said fuel feed device further comprising electric control means for driving only the electromagnetic valve means with a smaller fuel passage cross sectional area in synchronism with the frequency of said electric signals when the engine operates within a range where said air flow rate detecting means generates

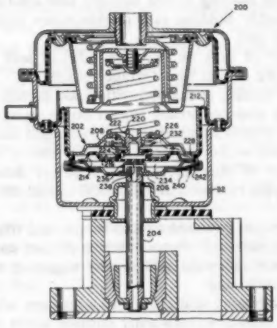


electric signals of lower frequencies, and driving at least the electromagnetic valve means with a larger fuel passage cross sectional area in synchronism with a frequency produced by dividing the frequency of said electric signals when the engine operates within a range where said air flow rate detecting means generates electric signals of higher frequencies.

4,256,076
EXHAUST GAS RECYCLING MODULATOR VALVE ASSEMBLY

Cyril E. Bradshaw, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 19, 1979, Ser. No. 50,281
Int. Cl.³ F02B *47/08*
U.S. Cl. 123—568 **3 Claims**



1. An exhaust gas recycling modulator valve assembly for use with an internal combustion engine, said assembly comprising:

(a) housing means including means defining an exhaust gas inlet and an exhaust gas outlet and means defining a fluid pressure chamber and an inlet therefor adapted for connection to a source of fluid pressure;

(b) an EGR valve member disposed for movement with respect to said housing means for controlling flow of exhaust gas from said exhaust inlet to said exhaust outlet;

(c) means responsive to the pressure in said fluid pressure chamber and operable to move said valve member;

(d) means defining an exhaust gas pressure chamber and an inlet communicating said exhaust gas chamber with said exhaust gas inlet;

(e) bleed valve means including a movable member and operable in an open condition to communicate said fluid pressure chamber with the atmosphere and in a closed

condition to seal said fluid pressure chamber from the atmosphere; and

(f) means movably responsive to the pressure in said exhaust gas chamber and operable to open said bleed valve only when said exhaust gas pressure in said exhaust gas inlet exceeds a predetermined value and close said bleed valve when said exhaust gas pressure is less than said predetermined value.

4,256,077

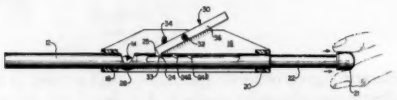
MARBLE SHOOTER DEVICE

Mark R. Munson, 6149 Vale St., Baton Rouge, La. 70812

Filed Jul. 31, 1978, Ser. No. 929,513

Int. Cl.³ F41F *1/00*

U.S. Cl. 124—26 **4 Claims**



1. A marble shooter device comprising:

a. a frame having two elongated sides attached together at one of their ends in a spaced-apart relationship by a front end frame piece and attached together at their other ends in spaced-apart relationship by a rear end frame piece;

b. a barrel mounted to said end frame pieces and between and substantially parallel to elongated sides, said barrel having;

i. a loading port on its upper side for loading said barrel with a marble,

ii. a barrel trigger notch in the top of said barrel and rearward of said loading port,

iii. marble holding means beneath said loading port for releaseably holding said marble when said marble is loaded, and

iv. a pair of slots on opposite sides of said barrel and rearward of said barrel trigger notch;

c. a striker slidably positioned within said barrel, said striker having at least one striker trigger notch on its upper side;

d. a power means attached to said frame and said striker to propel said striker towards the front end of said barrel, said point of attachment of said power means to said striker being rearward and adjacent to said striker trigger notch;

e. trigger means attached to said frame, said trigger means extending into said trigger notch to contact and hold said striker in a rearward position by engaging said striker trigger notch; and

f. means for biasing said trigger to a position whereby said striker is held in a rearwardly position when said trigger means engages said striker trigger notch.

4,256,078

BRICK FINISHING MACHINE

Parnell Whitty, Union Hill, N.Y., assignor to The R. T. French Co., Rochester, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,890

Int. Cl.³ B28D *1/18*

U.S. Cl. 125—3 **19 Claims**

1. A brick finishing machine for cutting and grinding rectangularly shaped bricks into specially configured bricks, comprising

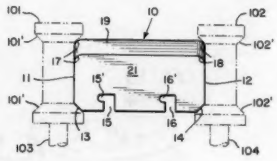
a first frame,

first drive means for conveying bricks in single file along a horizontal surface on said first frame from an inlet station adjacent one end of said frame to a discharge station adjacent the opposite end thereof.

a second frame having an inlet end connected to one side of said first frame adjacent said discharge station, and extending transverse to the path of travel of a brick on said first frame,

grinding means on said first frame for performing a series of grinding operations on different portions of each brick as it passes from said inlet to said discharge station,

first transfer means operative each time a brick reaches said discharge station on said first frame to effect transfer thereof onto the inlet end of said second frame,



second drive means for conveying bricks that are transferred from said first to said second frame in single file along a horizontal surface on said second frame from said inlet end thereof toward the opposite end of said second frame, and

means on said second frame for performing at least one cutting operation on each brick as it passes from said inlet to said opposite end of said second frame.

4,256,079

WIRE BLADES

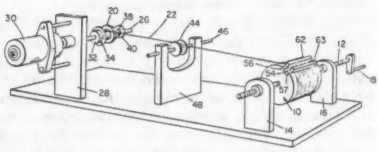
Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems Inc., Salem, Mass.

Division of Ser. No. 917,918, Jun. 22, 1978, Pat. No. 4,178,670.

This application Apr. 23, 1979, Ser. No. 32,251

Int. Cl.³ B28D *1/04*

U.S. Cl. 125—17 **4 Claims**



1. A wire blade pack comprising:

a pair of relatively movable spaced supports; and

a plurality of wires engaged by and extending between said supports,

each of said supports including a pair of opposed clamping surfaces engaging said wires and fixing said wires relative to said support with adjacent ones of said wires spaced at regular intervals from each other, the length of each of said wires between said supports being the same, and

the distance between adjacent ones of said wires at each of said supports being the same.

4,256,080

COOKING GRILL WITH LID

Arden W. Seach, 1828 Congress, Beloit, Wis. 53511

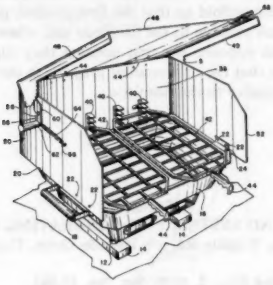
Filed Jun. 16, 1978, Ser. No. 916,234

Int. Cl.³ A47J *37/00*

U.S. Cl. 126—25 R **3 Claims**

1. Cooking apparatus comprising a cooking chamber containing a source of heat surrounded by an end wall and two parallel side walls; rack means in said end wall for receiving the rear part of at least one grid at a variable angle; a lid hinged to the upper end of said end wall; said lid having side flanges

adapted to fit over the upper ends of said side walls; one of said flanges including an arcuate toothed section; a spring latch on



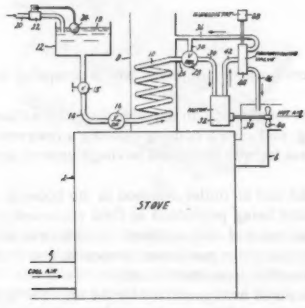
said side wall below said toothed section and adapted to engage said section to selectively close said lid over said walls.

4,256,081

AIR CIRCULATION AND HUMIDIFICATION SYSTEM FOR STOVES

Michael L. Stover, 320 SE. Thornton, De Moines, Iowa 50315

Filed May 16, 1979, Ser. No. 39,387
Int. Cl.³ F24D *9/00*
U.S. Cl. 126—101 **8 Claims**



1. A forced air circulation system for a stove having an inlet for air to be heated by said stove and an outlet for the heated air, said air circulation system comprising:

a. a steam generating unit adapted to be disposed within the stove structure, and operable by the heat of said stove to convert water to steam,

b. means supplying water to said steam generating unit,

c. a steam-driven motor,

d. means supplying steam from said steam generating unit to said motor to drive the latter, and

e. a blower fan disposed in the air outlet of said stove and operable by said motor to exhaust hot air from said stove.

4,256,082

WARM AIR FURNACE

Dale A. Scholten; Frederick J. Schreiner, both of Holland; Raymond J. Kenjesky, Muskegon, and Kenneth E. Bartlett, Holland, all of Mich., assignors to Lear Siegler, Inc., Holland, Mich.

Filed May 24, 1979, Ser. No. 42,094
Int. Cl.³ F24H *3/02;* **F23M** *9/00;* **F24D** *5/00*
U.S. Cl. 126—110 AA **11 Claims**

6. A heat exchanger for use in a forced air furnace, comprising:

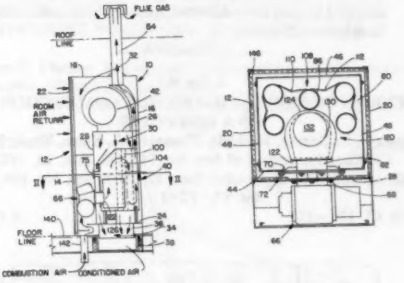
a top panel having a plurality of holes therein arranged in a generally U-shaped pattern with the base of the U being spaced from and generally parallel to a rear edge of the top panel;

a bottom panel positioned in vertically spaced superimposed relationship with said top panel having a plurality of holes in alignment with the holes of the top panel;

a wrapper extending around the periphery of each of said top panel and said bottom panel and joining said top panel to said bottom panel, said wrapper including means for supporting a flame gun;

a plurality of heat exchanger tubes extending between the holes of said top panel and said bottom panel;

a flame chamber having an open top and a flame gun access opening, said flame chamber resting on said bottom panel and being partially surrounded by said tubes with only one of said tubes contacting the rear of said flame chamber;



upper side baffles between adjacent pairs of tubes and extending downwardly from said top panel;

lower side baffles between said adjacent pairs of tubes between which said upper side baffles extend and further extending downwardly in spaced relationship with said upper side baffles to define exhaust gas outlet openings positioned closer to the top panel than to the bottom panel;

a rear baffle between said tubes at the base of the U pattern, said rear baffle extending from the top panel to a point spaced above said bottom panel to define additional exhaust gas outlet openings adjacent said bottom panel; and

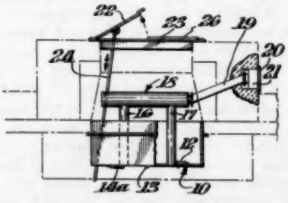
a flue extending from an opening in said top panel whereby combustion gases will pass upwardly to contact the top panel, around the tubes, through the exhaust outlet openings, between the side baffles, below the rear baffle and out the flue.

4,256,083

FIREBOX

Charles P. Wilson, R.D. #8, Box 278, Elkton, Md. 21921

Filed Jan. 8, 1979, Ser. No. 1,454
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **7 Claims**



1. A fire box for use in a fireplace which comprises:

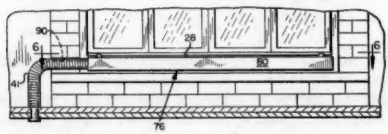
(a) an enclosed combustion chamber adapted to fit into a fireplace wall cavity which has a flue,
(b) said chamber having a front piece adapted to cover the opening of the wall cavity and to fit against said wall to provide an air-tight seal, said front piece containing a heat resistent transparent panel,
(c) said combustion chamber having duct means connected to said front piece and to the outdoors for drawing air from outdoors and directing said air into the room containing the fireplace wall cavity,
(d) said chamber having a rearwardly positioned door which contains an opening to the outdoors for the entry of air to the combustion chamber and means connected to said opening to close-off the interior of the chamber from the outdoors and said door being adapted for loading of combustible material to the combustion chamber, and
(e) flue means for exiting combustion gases to the flue;
Wherein, combustion within the combustion chamber heats said duct means thereby heating air within said duct means and said heated air is directed into the room containing the fireplace wall cavity.

4,256,084

DEVICE FOR SUPPLYING OUTSIDE COMBUSTION AIR TO A FIREPLACE

Elmer F. Engleman, 3615 Mt. Pleasant Rd., Kelso, Wash. 98626

Continuation-in-part of Ser. No. 914,378, Jun. 12, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,128
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—121 **1 Claim**



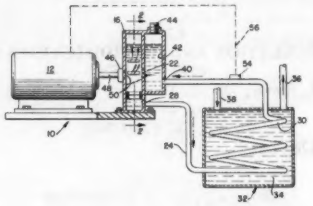
1. A device for supplying outside combustion air to a fireplace having a hearth, and firebox with an opening accessible from an inside room, a framework surrounding the opening for supporting a door which is operable to open and close the opening, said framework including a lower rail portion having at least one air supply aperture communicating between the inside room and the firebox, and a door track portion said device comprising:
a manifold extending generally laterally of said opening, said manifold including a wall positioned adjacent to the lower rail of the framework and defining an air passage therethrough positioned such that air is permitted to pass from the interior of said manifold through the passage and the aperture and into the firebox;
support means for supporting said manifold from the framework;
sealing means positioned between said wall and said lower rail for substantially sealing the space between the aperture and passage;
said manifold also having an outside air receiving opening positioned above the upper surface of the hearth;
said manifold being of generally rectangular box-like construction, said manifold having first and second end walls and the outside air receiving opening being defined by the first end wall, said device including a first conduit fastened to said first end wall and communicating with the interior of the manifold through the outside air receiving opening, said first conduit being adapted for connection to an additional conduit in communication with an outside area so that outside combustion air is permitted to flow through the additional conduit, the first conduit, the outside in receiving opening and into the manifold, said support means comprising at least two mounting brackets removably connected at a lower end portion to said wall and having a hooked upper end portion for engaging the door track portion of the lower rail, said mounting brackets being reversible such that when in a first position they support the manifold so that the first conduit projects in one direction relative to the fireplace and when in a second position opposite the first position they support the manifold so that the first conduit projects in the opposite direction relative to the fireplace.

4,256,085

METHOD AND SYSTEM FOR GENERATING HEAT

Howard C. Line, Walpole Rd. c/o Hillside Orch., Haydenville, Mass. 01039

Filed Mar. 2, 1979, Ser. No. 16,863
Int. Cl.³ F24C *9/00*
U.S. Cl. 126—247 **16 Claims**



1. A system for generating heat which comprises in combination:
(A) means for rotating an impeller disposed within a closed housing, said closed housing defining a reservoir containing a heat transfer liquid and having a gaseous layer thereover;
(B) an inlet and an outlet disposed in the housing, said inlet and outlet being positioned in fluid communication with the reservoir and with a closed conduit circuit;
(C) a heat dissipator positioned to receive and transfer heat from the closed conduit circuit;
whereby frictional heat generated by the impeller in the reservoir is imparted to the heat transfer liquid which is then forced to circulate through the closed conduit circuit by means of pressure created by the impeller.

4,256,086

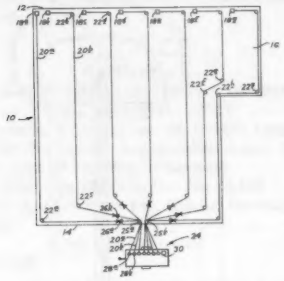
METHOD FOR RAPIDLY IGNITING COMBUSTIBLE MATERIAL ON A FIELD

Kenneth R. Collett, 2566 Neff Ct., Boise, Id. 83702, and LeRoy C. Hansen, 7945 Knox Butte Rd., Albany, Oreg. 97321

Filed Aug. 28, 1978, Ser. No. 937,188
Int. Cl.³ F23C *5/00*
U.S. Cl. 126—271.2 C **13 Claims**

1. A method for rapidly igniting combustible material over a predetermined area of a ground surface between first and second boundaries comprising:
extending a line between the boundaries across the predetermined area;
attaching a combustible element to said line adjacent the first boundary;
positioning a line takeup means adjacent the second boundary and attaching the line to said takeup means;
igniting said element; and

advancing said line and its associated element substantially across the predetermined area by operating the takeup



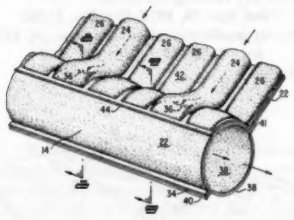
means to draw the line and its associated element toward the second boundary.

4,256,087

SWIMMING POOL SOLAR HEATER

Charles Sowers, 5045 Medina Rd., Woodland Hills, Calif. 91364

Filed Mar. 6, 1978, Ser. No. 883,654
Int. Cl.³ F24J 3/02
U.S. Cl. 126—415 **8 Claims**



1. A solar heating panel for floating on a swimming pool and for transferring heat to said swimming pool comprising:

spaced water intake and collection manifolds and a plurality of water passageways laterally spaced from one another and fluid connected to said manifolds,

a plurality of air chamber means at least some of which are disposed between at least some of said water passageways for absorbing solar energy and transferring said absorbed energy to the upper layer of water in the pool, for providing buoyancy and for providing night time insulation to the pool water, said air chamber, means thereby providing heat by solar energy to an upper layer of pool water,

said water passageways having the upper portion thereof exposed to solar radiation to absorb heat therefrom, and the lower portion thereof in engagement with the upper portion of the pool water additionally to absorb thermal energy therefrom.

8. A solar heating panel constructed of five sheets of flexible material of arbitrary length and designed for circulating a fluid heat transfer medium therethrough comprising:

an intake manifold;

a collection manifold;

a plurality of fluid passageways which communicate with both the intake and collection manifold;

a plurality of sealed air chambers interspersed among, and substantially coplanar with, the fluid passageways;

the first of said five sheets having a first and second edge and being provided with a plurality of laterally extending pleats which have their opposite edges bonded together so as to form said passageways and said chambers on one side of the first sheet and present a smooth surface on the other side of said first sheet;

the second, third, fourth and fifth of said five sheets each having a first edge and a second edge, said second edge of said second and third sheets being bonded on one side of said first sheet along the first and second edges of said first sheet;

said second edge of said fourth and fifth sheets being bonded to the other side of said first sheet along the first and second edges thereof respectively;

the first edges of said second and fourth sheets being bonded together so as to form the intake manifold and the first edges of said third and a fifth sheets being bonded together so as to form the collection manifold;

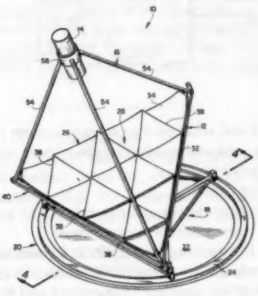
said passageways having an inflated diameter larger than the inflated diameter of said chambers.

4,256,088

SOLAR CONCENTRATOR UTILIZING A POINT FOCUSING SOLAR CONCENTRATING PANEL ASSEMBLY

Jorgen O. Vindum, San Ramon, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Sep. 14, 1978, Ser. No. 942,350
Int. Cl.³ F24J 3/02
U.S. Cl. 126—418 **12 Claims**



1. A solar concentrator, comprising:

(a) a point focusing solar concentrating panel assembly, said assembly including

(i) first means defining an overall reflecting surface of parabolic cross sectional configuration having a predetermined focal point and an outermost periphery which at least approximates a triangle, and

(ii) second means for supporting said reflecting surface defining first means;

(b) receiver means for converting solar energy to another form of energy;

(c) means for fixedly supporting said receiver means at said predetermined focal point whereby to receive solar energy interrupted by said reflecting surface and reflected towards said focal point; and

(d) means connected with a fixed horizontally extending support surface for supporting said panel assembly such that one side of said periphery is substantially parallel with and adjacent to said support surface, said panel assembly supporting means including

(i) means supporting said panel assembly for pivotal movement above an axis parallel with said one side of said periphery between a stow position during which said reflecting surface is substantially horizontal and a raised operating position during which said reflecting surface is angled relative to said horizontal surface,

(ii) means for tilting said panel assembly about said parallel axis,

(iii) means supporting said panel assembly for rotation about a vertical axis through said support surface, and

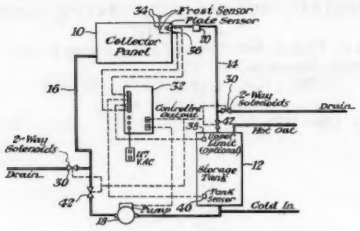
(iv) means for rotating said assembly about said vertical axis.

4,256,089

DRAIN DOWN FREEZE PREVENTION CONTROL SYSTEM FOR A SOLAR COLLECTOR

Raymond H. Lewis, Jr., 3114 Tuxedo Ave., West Palm Beach, Fla. 33405, and James B. Carr, 4897 Andros Dr., West Palm Beach, Fla. 33407

Filed Feb. 6, 1978, Ser. No. 875,371
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—420 **4 Claims**



1. In a closed solar energy storage system utilizing a collector, storage tank and conduit return system, a freeze protection drain comprising:

a collector drain;

collector temperature sensing means;

ambient temperature sensing means;

a means for opening said drain at a predetermined value of said ambient temperature or collector temperature connected to said ambient temperature and collector temperature sensing means;

a means for closing said drain;

means for sensing the temperature difference between said collector and said storage tank connected to said means for closing said drain whenever said temperature differential reaches a predetermined value; and

means connected to said means for closing said drains for overriding said means for opening said drains whenever said temperature differential is at a predetermined value.

4,256,090

SOLAR HEATING SYSTEM

Alessandro Imperiale, 42 Nostrand Ave., Brentwood, N.Y. 11717

Filed Oct. 1, 1979, Ser. No. 80,514
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **2 Claims**

1. A solar heating system adapted to be installed in a chimney comprising:

an open base mounted on top of the chimney,

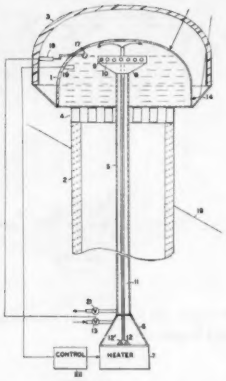
a solar tank mounted on the open base,

a translucent dome covering the top of the solar tank,

an outer pipe extending down from the solar tank through the chimney,

a heating tank at the lower end of the chimney, the outer pipe extending down to the heating tank,

an inner pipe coaxially mounted in the outer pipe and extending from the heater tank up to the solar tank,



means connected to admit cold water to the heater tank, and

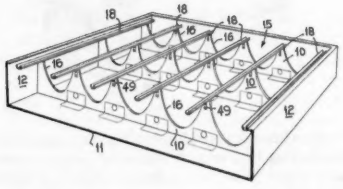
means connected to the outer pipe to discharge hot water.

4,256,091

FLUX CONCENTRATING SOLAR FLUID HEATER

Pier St., 1 Pier St., Glenelg, Australia

Filed Apr. 24, 1979, Ser. No. 32,907
Claims priority, application Australia, Apr. 24, 1978, PD4150
Int. Cl.³ F24J *3/02;* **F28F** *7/00*
U.S. Cl. 126—438 **7 Claims**



1. A solar energy collector comprising;

(a) a plurality of elongated upwardly-open trough-shaped reflectors placed side by side and each having facing surfaces joined by a curved section, each of said reflectors being formed by selecting a rectangular flat flexible sheet which has a reflective surface,

(b) a series of templates spaced along the said reflectors and having upwardly opening recesses the walls of which engage and shape the said reflectors when said sheets are pressed downwards into the said recesses whereby to each form an upwardly-open trough-shaped reflector having the said facing surfaces of parabolic form joined by the said curved section, the axis of the said parabolic surfaces being disposed about a medial axis of the trough but with the axes of the parabolic surfaces displaced outwardly from the said medial axis and inclined thereto to intersect outside of the said reflector on the reflector medial axis but beneath the said curved joining section,

(c) locking members engaged on the said templates between the said recesses and engaging the edges of the said reflectors to retain them in the said recesses,

(d) a frame supporting the said templates in spaced relationship,

(e) means to support the said frame to allow it to be orientated about a horizontal axis positioned in line with the axis of the said elongated reflectors, and

(f) a heat collector tube supported by the said frame and disposed at the focal area of each of the said reflectors and constructed to act as an absorber of heat focused on to it by the said reflectors.

4,256,092

DEVICE FOR THE CONVERSION OF SOLAR RADIATION INTO HEAT

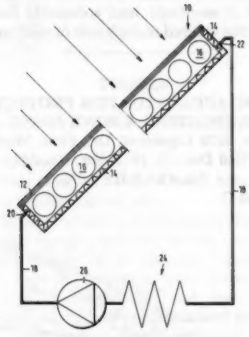
Paul F. Gutermuth, Augustastrasse 48, D-6456 Langenselbold, and Heinrich W. Detjen, August-Bebel-Strasse 11, D-6451 Bruchköbel, both of Fed. Rep. of Germany

Filed Feb. 28, 1979, Ser. No. 16,691

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809547

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—449 **10 Claims**



1. A device for the conversion of solar radiation into heat including absorber elements arranged side by side in a heat-insulated collector, at least one surface of which is permeable to solar radiation, and through which a fluid medium flows, characterized by: the absorber elements being rotationally symmetrical bodies configured as balls (**28**), and being pivotally arranged.

4,256,093

PROSTHETIC URINARY SPHINCTER

Curtis R. Helms, and Harold M. Smyly, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 12, 1978, Ser. No. 950,877

Int. Cl.[3] **A61B** *19/00;* **A61F** *1/00*

U.S. Cl. 128—1 R **4 Claims**

1. In a prosthetic sphincter device for controlling urinary incontinence of the type having an inflatable urethral collar for surrounding the urethra and preventing flow in the urethral passage when inflated while permitting flow when deflated, a pump/valve unit for inflating and deflating said collar comprising:

a compressible bulbous pump means having an interior space defining a fluid reservoir;

a valve unit integral with said bulbous pump means which includes:

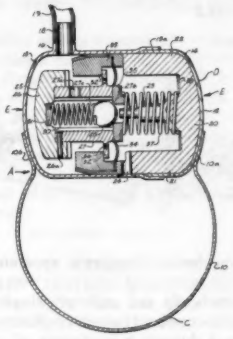
a valve housing having a resilient depressible portion;

said valve housing having a first port communicating with said fluid reservoir and a second port adapted for connection to said inflatable collar;

a fluid flow path in said valve housing between said first and second ports;

a valve member enclosed within said housing disposed in said fluid flow path having a valve actuator element operable by depression of said resilient portion of said valve housing;

said valve member including a valve element having a first position permitting fluid flowthrough said valve member and a second position blocking fluid flow therethrough; and



said valve element occupying said first position in response to the compression of said pump means allowing fluid to flow from said reservoir to said inflatable collar and in response to said operation of said actuator element allowing fluid to flow from said collar to said reservoir.

4,256,094

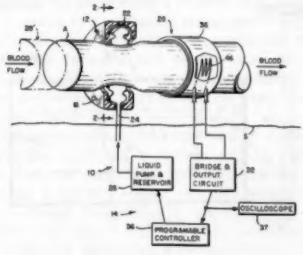
ARTERIAL PRESSURE CONTROL SYSTEM

John P. Kapp, 455 Bunkers Cove Rd., Panama City, Fla. 32401; James T. Robertson, 628 W. Trezevant, Memphis, Tenn. 38112, and Elton M. Tucker, 8 Oxbow Rd., Medfield, Mass. 02052

Filed Jun. 18, 1979, Ser. No. 49,419

Int. Cl.[3] **A61H** *9/00;* **A61B** *17/12*

U.S. Cl. 128—24 R **7 Claims**



1. A blood pressure control system comprising

A. occluding means for engaging a patient's artery which when increasingly actuated increasingly occludes the artery,

B. means for actuating the occluding means,

C. blood pressure sensing means arranged for sensing the blood pressure downstream from the location of the occluding means on the artery,

D. means establishing a reference pressure,

E. means for comparing the sensed pressure with the reference pressure to produce a control signal, and

F. means for controlling said actuating means in response to said control signal so as to increase or decrease the pressure in the artery as necessary to maintain the pressure in the artery at the reference pressure.

4,256,095

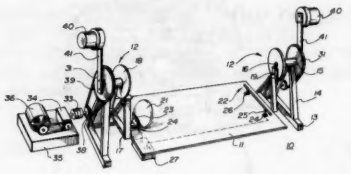
ELECTROMECHANICAL THERAPEUTIC APPARATUS

David J. Graham, 18 Edithvale Ave., Willowdale, Ontario, Canada (M2N 2R5)

Continuation of Ser. No. 761,693, Jan. 24, 1972, abandoned. This application Oct. 26, 1978, Ser. No. 955,141

Int. Cl.[3] A61N 1/40

U.S. Cl. 128—24.1 10 Claims



10. Electromechanical therapeutic apparatus, comprising in combination:

means for cyclically and uniformly displacing a reclining human body completely around a predetermined horizontal axis and through a continuum of vertically spaced horizontal planes while maintaining the body in a substantially fixed horizontal attitude;

generator means having a low voltage output producing a continuous uniformly varying low frequency signal that is substantially free of discontinuities; and

electrode means connected across said output and disposed on the displacing means adjacent opposite ends of the body such that the electrode means are stationary relative to the body when the body is displaced, the electrode means producing a low energy electric field intermediate said ends in response to said signal.

4,256,096

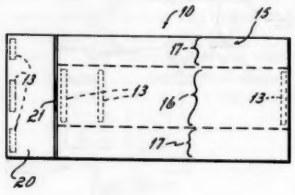
MATTRESS ASSEMBLY FOR TREATMENT OF PATIENTS

Richard B. Budde, 506 Oak St., Cincinnati, Ohio 45219

Filed Jul. 25, 1979, Ser. No. 60,647

Int. Cl.[3] A61F 5/00

U.S. Cl. 128—70 8 Claims



8. A patient support for use in the treatment of spine injuries, comprising

a base mattress,

a body pad for positioning on the mattress, the body pad having a length shorter than the mattress and providing support of the body but not the head of a patient lying thereon, and

a series of head and shoulder support pads, each removably attachable to at least one of said mattress and body pad,

said series of pads comprising,

a first head support pad which, when positioned on said mattress abutting a head end of said body pad, provides support for the head of said patient,

the body pad when said first head support pad is removed therefrom supporting the body of said patient while his head rests at a lower level so that the patient's head and neck are in extension,

said series of pads also including a second head support pad having a width substantially less than that of said mattress, the second head support pad attachable to at least one of said mattress and body pad for supporting a patient's head to which a skull tong has been applied,

a shoulder support pad of tapering thickness and positionable between the body pad and the mattress to provide additional support for the shoulders of a heavy patient during such extension, said shoulder support pad having its greatest thickness adjacent the head end of said body pad and tapering to a minimum thickness in the direction toward the patient's pelvis,

said body pad comprising,

a central portion of a foam which softens under the patient's body heat to conform to the shape of the patient's body, thereby to relieve pressure points on the skin, and

side portions of non-body heat softenable foam, said side portions being secured to each side of said central portion.

4,256,097

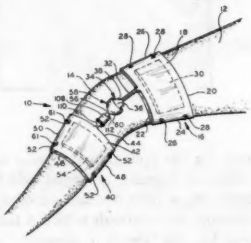
ORTHOPEDIC APPARATUS FOR PROTECTING AND SUPPORTING A BONE JOINT

Robert E. Willis, 2020 Lippencott Dr., Flint, Mich. 48503

Filed Dec. 29, 1978, Ser. No. 361

Int. Cl.[3] A61F 5/00

U.S. Cl. 128—80 C 13 Claims



1. An orthopedic apparatus for supplementing bone joint functions in an appendage comprising:

a first support member having a cushion member attached thereto for contacting an appendage;

means for securing said first support member to an appendage on one side of a bone joint;

a first rigid arm extending from said first support member and terminating in a ball member of the ball and socket joint positioned such that when said first support is secured to an appendage on one side of a bone joint the ball member of the ball and socket joint is located adjacent a bone joint;

a second support member having a cushion member attached thereto for contacting an appendage;

means for securing said second support member to an appendage on the other side of a bone joint;

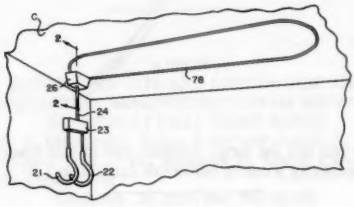
a second rigid arm extending from said second support member and terminating in a socket member of a ball and socket joint positioned such that when said first support is secured to an appendage on the other side of the bone joint the socket member of the ball and socket joint is located adjacent the bone joint, said ball and socket joint including a sperically shaped ball retained by a generally cup-shaped socket, said socket being mounted on said second arm such that the socket axis, defined by the line through the center of the opening of said socket and the center of the bottom portion of said socket, is aligned with the axis of said second arm; and

one of said rigid arms having shock absorbing means connected intermediate its opposite ends.

4,256,098
SAFETY RESTRAINT SYSTEM FOR AMBULATORY PATIENTS

Algernon G. Swan, 114 Rivershire La., Lincolnshire, Ill. 60015; Eugene A. Stead, Jr., Rte. 1, Box 135, Clarksville, Va. 23927; William P. Thompson, 6315 Scatterfield Rd., Anderson, Ind. 46015, and David P. Colvin, Rte. 5, Box 67, Apex, N.C. 27502

Filed Nov. 8, 1979, Ser. No. 92,568
Int. Cl.[3] A61F *13/00*
U.S. Cl. 128—133 14 Claims



1. A safety restraint system for ambulatory patients comprising

an overhead track,

an inertial reel mounted for movement horizontally on said track in a predetermined path,

a retractable cord extending downwardly from said reel, and

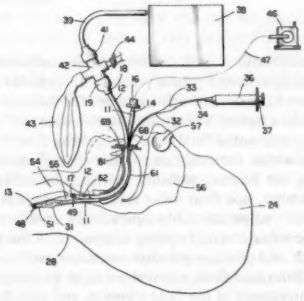
harness means on the lower end of said cord for releasably connecting said cord to an ambulatory patient, or the like, whereby upon movement of said patient along a path parallel to said overhead track, said reel is caused to travel on said track along said predetermined path,

said reel including first means resiliently resisting withdrawal of said cord from said reel, and second means for automatically increasing the resistance to withdrawal of said cord from said reel, when the rate of withdrawal of the cord exceeds a predetermined value.

4,256,099
TWO-TUBE RESUSCITATION SYSTEM

Gale E. Dryden, 5835 N. Tacoma, Indianapolis, Ind. 46220

Filed Mar. 21, 1979, Ser. No. 22,639
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—200.26 8 Claims



1. Resuscitation apparatus comprising:

first and second curved resilient tubes, each tube having a proximal end and a distal end, said tubes being in side-by-side relationship throughout a portion of their length, with the distal end of the second tube spaced lengthwise of said first tube from the distal end of said first tube,

an external inflatable cuff on said first tube between the distal end of said first tube and the distal end of said second tube,

cuff inflating means extending from said cuff to a point near the proximal end of said first tube, and

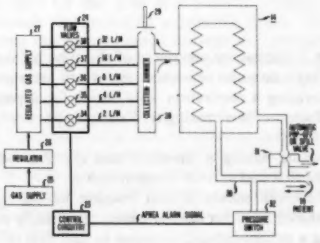
a guide member having first and second curvilinear guideways therein receiving said tubes therein, said first tube being longitudinally and guidedly slidable in said first guideway for direction to the esophagus of a subject to be treated,

said guide member having a proximal end and a distal end and a locator flange remote from the distal end, said guideways having the same curvatures throughout most of their lengths from the proximal end toward the distal end of said member, and each of said guideways having a curvilinear longitudinal axis in a plane parallel to a longitudinal axis plane of the other guideway, each of said guideways having an exit end at the distal end of said guide member, with said exit ends remaining in said plane but having diverging axes.

4,256,100
FLOW CONTROL EQUIPMENT

Donald Levy, River Vale, N.J., and Tibor Rusz, Pittsfield, Mass., assignors to Rule Medical Instruments, Inc., Pittsfield, Mass.

Filed Feb. 12, 1979, Ser. No. 11,636
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—204.21 30 Claims



1. Equipment for controlling a flow of fluid during inspiration from a source to a utilization means and comprising

a plurality of valves adapted to be connected in a parallel arrangement between said source and said utilization means, each of said valves being individually operable to deliver a prescribed fluid flow from said source to said utilization means during inspiration,

control means including a first control device independently settable for supplying a distinct minute volume (MV) signal, a second control device independently settable for supplying a distinct breath rate (R) signal and a third control device independently settable for supplying an inspiratory (I) time to expiratory (E) time ratio signal, and

circuit means for delivering a predetermined tidal volume (TV) of said fluid from said source to said utilization means and being responsive to a receipt of said minute volume (MV), breath rate (R) and inspiratory (I) time to expiratory (E) time ratio signals for electrically combining said signals in accordance with the function,

$$MV\ (1+E/I)$$

where $MV = TV \times R$

and for controlling the operation of said valves to provide said prescribed inspiratory fluid flow and deliver said predetermined tidal volume, and

said circuit means comprising

means responsive to said minute volume and inspiration to expiration ratio signals for generating a signal prescribing said fluid flow and

means responsive to said prescribing signal for operating predetermined ones of said valves to deliver the prescribed fluid flow, and

each of the operated ones of said valves delivering a different magnitude of flow from said source to said utilization means.

4,256,101

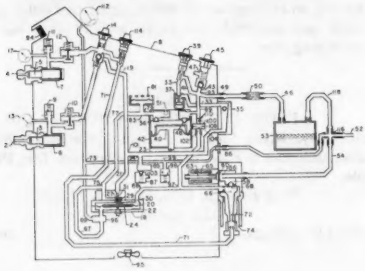
THERMISTOR ASSIST SENSING

Raymond A. Ellestad, Rialto, Calif., assignor to Bourns Medical Systems, Inc., Riverside, Calif.

Filed Mar. 5, 1979, Ser. No. 17,792

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.23 **12 Claims**



1. In a respiratory ventilator of the type having means for providing a constant reference respiratory pressure and means for providing a respiration assist mode for a patient, an improved sensor for actuating said assist mode providing means, comprising:

a housing having a chamber, said chamber being divided into first and second compartments;

first conduit means in said housing having an elongated reduced diameter tubular passage for fluidly communicating a patient-induced pressure to said first compartment;

second conduit means in said housing for fluidly communicating said reference pressure to said second compartment;

diaphragm means, in said chamber, for (a) dividing said chamber into said first and second compartments, and (b) providing a high velocity, low volume flow of gas through said first conduit means in response to a patient-induced pressure differential between said first and second compartments, the velocity and volume of said flow of gas being determined at least substantially in part by the diameter of said passage;

fluid flow sensing means in said first conduit means for producing an electrical output signal in response to said flow of gas through said first conduit means; and

actuation means, responsive to said electrical output signal, for actuating said assist mode providing means.

4,256,102

SUBCUTANEOUS DIALYSIS SYSTEM

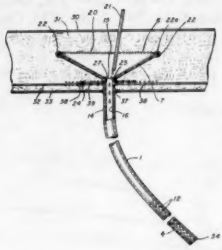
Anthony P. Monaco, 73 Brackett Rd., Newton, Mass. 02158

Filed May 14, 1979, Ser. No. 38,777

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—213 A **5 Claims**

1. A means for peritoneal dialysis comprising an elongated tube having an opening at one end and perforations formed along a section thereof, means for securing said tube with said perforations within the peritoneal cavity and with said one end subcutaneous but external of said peritoneal cavity, and means forming a perforable diaphragm over said open end, comprising a solid wall member having a frustoconic shape with the smaller diameter end of said frustoconic shape connected to



said one end and the larger diameter end of said frustoconic shape supporting a needle perforable diaphragm.

4,256,103

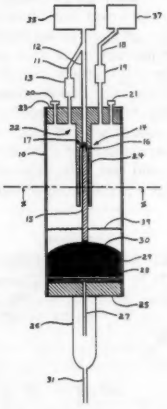
AUTOMATIC SEQUENTIAL FLUID FLOW APPARATUS

Kenneth C. Mylrea, Tucson, Ariz., assignor to James Paxinos, Tucson, Ariz., a part interest

Filed Oct. 11, 1978, Ser. No. 950,329

Int. Cl.³ A61M *5/14*

U.S. Cl. 128—214 R **5 Claims**



1. In combination with an intravenous administration set having interconnected primary solution container, calibrated volumetric chamber, and drip chamber for infusion of primary solution into a patient's body, an improvement for controlling non-mixing sequential fluid flow comprising float valve means positioned within the calibrated volumetric chamber operably controlling the primary solution entering the calibrated volumetric chamber, said float valve means defining a float element and a needle valve assembly operatively connected thereto, said needle valve assembly being connected in fluid communication with said primary solution container and being situated upstream from said float element so as to be operated by the buoyant movement of the float element, and said float element constructed to conform to the bottom and sides of the calibrated chamber, said float element so arranged with said needle valve assembly to float in close proximity to said calibrated volumetric chamber bottom; and means introducing a secondary solution into the said chamber, said means including a secondary solution container, tubing interconnecting said secondary solution container and the calibrated chamber, and a flow valve disposed in said tubing, said float valve means

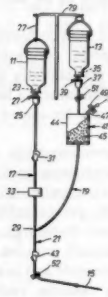
operably controlled by the secondary solution in the calibrated chamber whereby the flow of the secondary solution into the calibrated chamber may be controlled by the secondary solution flow valve in order that minimum secondary solution present in the calibrated chamber operates said float, and said float valve means controls the entry of primary solution into the calibrated chamber through said needle valve assembly following termination of secondary solution with minimum mixing of solutions.

4,256,104

EQUIPMENT SETS AND SYSTEM FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS AT DUAL FLOW RATES

Andrew J. Muetterties, Gages Lake, and Joseph N. Genese, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 28, 1979, Ser. No. 16,461
Int. Cl.³ A61M 5/14
U.S. Cl. 128—214 G **24 Claims**



1. In a set for the sequential administration of medical liquids to a patient, said set including:

a primary tube for the flow of a primary medical liquid therethrough and including a primary valve for controlling the flow of liquid through said primary tube,

a secondary tube for the flow of a secondary medical liquid therethrough,

a common tube having its distal end in fluid communication with the proximal ends of said primary and secondary tube and its proximal end open for the flow of liquid therefrom to form a primary liquid flow path comprising said primary tube and said common tube and a secondary liquid flow path comprising said secondary tube and said common tube, the improvement which comprises:

a secondary flow control means in said secondary liquid flow path for adjusting the flow rate of said secondary liquid therethrough,

a primary flow control means on said primary tube for adjusting the flow rate of said primary liquid through said primary flow path to a rate independent of the flow rate of said secondary liquid through said secondary liquid flow path, and

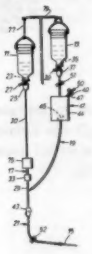
an air barrier means within said secondary liquid flow path substantially impervious to air but permitting liquid flow there through while said set is in use and preventing the flow of air therethrough after said secondary liquid has been depleted, whereby, following administration of said secondary liquid, flow of said primary liquid may be resumed at the preset rate without adjustment of said primary or said secondary flow control means.

4,256,105

EQUIPMENT SETS HAVING REDUCED DIAMETER PRIMARY TUBE FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS AT DUAL FLOW RATES

John J. Leahey, Libertyville; Andrew J. Muetterties, Gages Lake, and Joseph N. Genese, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 28, 1979, Ser. No. 16,267
Int. Cl.³ A61M 5/14
U.S. Cl. 128—214 G **20 Claims**



1. In a set for the sequential administration of medical liquids to a patient, said set including:

a primary tube for the flow of a primary medical liquid therethrough and including a primary check valve for controlling the flow of liquid through said primary tube which preventing backflow of a liquid therethrough,

a secondary tube for the flow of a secondary medical liquid therethrough,

a common tube having its distal end in fluid communication with the proximal ends of said primary and secondary tube and its proximal end open for the flow of liquid therefrom to form a primary liquid flow path comprising said primary tube and said common tube and a secondary liquid flow path comprising said secondary tube and said common tube, and

a flow control means in said secondary liquid flow path for adjusting the flow rate of liquid therethrough, the improvement which comprises:

primary flow control means on said primary liquid flow path comprising a first portion of said primary tube located on the distal side of said primary valve and having a constricted inner diameter for restricting the flow rate of said primary liquid through said primary flow path to a predetermined rate independent of the flow rate of said secondary liquid through said secondary liquid flow path, and

an air barrier means within said secondary liquid flow path substantially impervious to air but permitting liquid flow therethrough while said set is in use and preventing the flow of air therethrough after said secondary liquid has been depleted.

4,256,106

RESEALABLE DEVICE

Bernard A. Shoor, New York, N.Y., assignor to Becton, Dickinson and Company, Paramus, N.J.

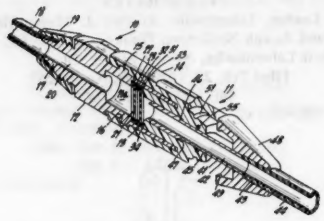
Filed Apr. 30, 1979, Ser. No. 34,856
Int. Cl.³ A61M 3/00
U.S. Cl. 128—247 **17 Claims**

1. A device, comprising:

a housing having an open end and defining a material receiving interior;

a resilient membrane closing and sealing the open end of the housing, said membrane including at least one preformed opening which is normally closed and which is opened upon stretching the membrane, with the opening being closed upon release of the stretching force; and said hous-

ing including an integral movable stretching means within the housing for applying a releasable stretching force to the membrane to open and close the at least one pre-



formed opening in the membrane, whereby material can be transferred through the opening on application of the stretching force and material transfer prevented by release of the stretching force.

4,256,107

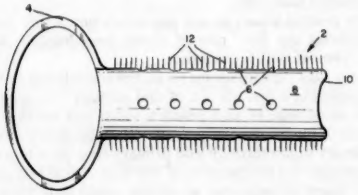
VAGINAL CLEANSING APPARATUS

Ruth White, 923 Second St., Santa Monica, Calif. 90403

Filed Jul. 30, 1979, Ser. No. 62,007

Int. Cl.[3] A61M *7/02*

U.S. Cl. 128—251 **5 Claims**



1. A vaginal cleansing apparatus for use in a human vagina, comprising:

a sleeve closed at one end;

retrieving means associated with an open opposite end of said sleeve for retrieving said apparatus from the vagina;

a multiplicity of holes in the side wall of said sleeve;

brushing means associated with the periphery of said sleeve for brushing the vaginal wall;

an essentially solid shaft seated in said sleeve and having a longitudinal bore extending from an open first end thereof to a closed second end thereof;

a multiplicity of channels in said shaft extending from said bore to the shaft periphery and slanting toward said open first end, said channels being alignable with said holes in said sleeve;

capping means associated with said shaft for capping said open first end; and

alignment means associated with said shaft for aligning said channels with said holes.

4,256,108

MICROPOROUS-SEMIPERMEABLE LAMINATED OSMOTIC SYSTEM

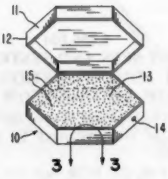
Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 785,582, Apr. 7, 1977, Pat. No. 4,160,452. This application May 21, 1979, Ser. No. 34,275

The portion of the term of this patent subsequent to Jul. 10, 1996, has been disclaimed.

Int. Cl.[3] A61M *7/00*

U.S. Cl. 128—260 **66 Claims**



1. An osmotic therapeutic system for the controlled dispensing of a drug formulation to an animal, which system comprises:

(a) a shaped laminated wall comprising a lamina formed of a semipermeable material permeable to the passage of an external fluid and substantially impermeable to the passage of drug formulation, and a lamina formed of a microporous material, said laminated wall surrounding and forming;

(b) a compartment containing the drug formulation which exhibits an osmotic pressure gradient across the wall, and wherein the drug is a member selected from the group of drugs that act on the peripheral and central nervous systems, adrenergic and cholinergic receptors, skeletal system, skeletal and smooth muscles, circulatory and cardiovascular systems, synoptic and neuroeffector sites, alimentary and excretory systems, endocrine, hormone, autocoid, reproductive and immunological systems; and,

(c) a passageway in the laminated wall communicating with the compartment and the exterior of the osmotic system for dispensing drug from the system over a prolonged period of time.

4,256,109

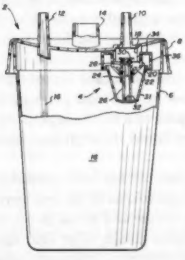
SHUT OFF VALVE FOR MEDICAL SUCTION APPARATUS

Robert L. Nichols, 808 Ft. Worth St., Jacksonville, Tex. 75766

Continuation-in-part of Ser. No. 923,346, Jul. 10, 1978. This application Jul. 10, 1978, Ser. No. 923,397

Int. Cl.[3] A61M *1/00*

U.S. Cl. 128—276 **8 Claims**



1. A medical suction apparatus for receiving and containing fluid from a patient during a medical procedure, comprising:

a canister for receiving and containing the fluid from the patient;

a lid for sealably covering said canister;

at least one suction port formed on said lid and communicating between the interior and exterior of said canister covered by said lid;

a plunger guide mounted within said canister covered by said lid and including a plurality of fingers depending downwardly from said lid adjacent said suction port and a generally vertical tubular means depending from said fingers disposed directly below said suction port;

a plunger formed from a flexible material and including an upwardly facing concave surface integrally formed on the top of said plunger, said concave surface including an upwardly facing concave disc attached to said plunger at the center of said disc and having a diameter greater than the diameter of said plunger, so that the disc engages the top of the tubular means to limit the downward sliding motion of said plunger, said plunger and said tubular means being cylindrical with the lower end of said tubular means including an aperture for allowing fluid to enter said tubular means to float said plunger; and

said plunger being supported within said tubular means for sliding motion, so that when the fluid within the canister is below a predetermined level, air may pass from within said canister between said fingers and into said suction port, and when the fluid within the canister rises to the predetermined level, the plunger floats and slides upwardly in said tubular means forcing said concave surface into a sealed relationship covering and blocking said suction port.

4,256,110

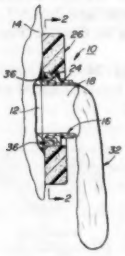
DRAINAGE POUCH SYSTEM

Alfred M. Scoville, 8005 McKenstry Dr., Laurel, Md. 20810

Filed Aug. 29, 1978, Ser. No. 937,790

Int. Cl.[3] A61F *5/44*

U.S. Cl. 128—283 **14 Claims**



1. A post-surgical drainage pouch system for collection of discharge materials from a body opening, comprising:

(a) an extended tubular member having a through opening, said tubular member including a flange secured to an outer wall surface intermediate said extension of said tubular member, said flange having an outer diameter greater than an outer diameter of said tubular member forming a shoulder portion;

(b) a resilient planar member having a through opening substantially equal to said flange outer diameter, said flange being secured to an inner wall of said resilient planar member through opening;

(c) a pouch member having an open end section, said open end section being insertable through said tubular member opening; and,

(d) a resilient annular disk member insertable within said planar member through opening and around said tubular member outer wall surface within said shoulder portion for releasably capturing said pouch open end section between said flange and said resilient annular disk.

4,256,111

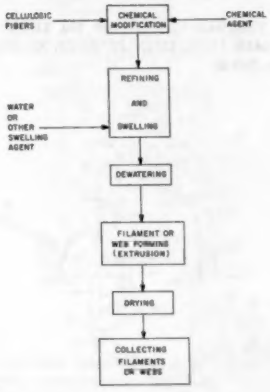
FILAMENTS OF CHEMICALLY MODIFIED CELLULOSE FIBERS AND WEBS AND PRODUCTS FORMED THEREFROM

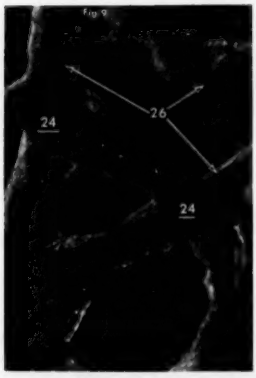
Frederick O. Lassen, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 1, 1973, Ser. No. 402,311

Int. Cl.[3] A61F *13/20*; B32B *5/02*

U.S. Cl. 128—284 **15 Claims**





1. A highly absorbent, fast wicking filament comprising fibers of a chemically modified cellulose, which has been transformed by derivatization to increase its hydrophilic character, said fibers being selected from the group consisting of,

(a) cellulose that has been chemically substituted by etherization or esterification,

(b) cellulose that has been chemically substituted by etherization or esterification and cross-linked, and

(c) cellulose that has been polymeric grafted, said fibers being generally of papermaking size and having been extruded through an orifice having a diameter of about 0.005 to about 0.060 inch and interbonded so as to be generally aligned and form channels within said filament for transporting liquid.

11. A sanitary napkin comprising a liner and an absorbent

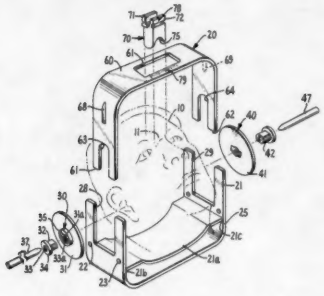
material wherein the absorbent material includes the filaments of claim 1.

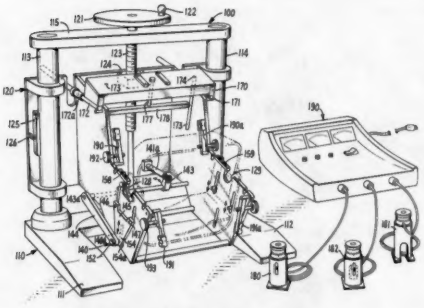
4,256,112

HEAD POSITIONER

J. David Kopf, Tujunga; William Seiler, Jr., Van Nuys; Gerald S. Palecki, Burbank, all of Calif., and Howard H. Kaufman, Houston, Tex., assignors to David Kopf Instruments, Tujunga, Calif.

Filed Feb. 12, 1979, Ser. No. 11,712
Int. Cl.[3] A61B *17/00*; G01N *21/00, 23/00*; A61G *13/00*
U.S. Cl. 128—303 B **5 Claims**





1. A headband for use in repeatably positioning a patient's cranium in precisely the same position relative to medical equipment, said headband comprising:

a front component having a contact for engaging the nasion of a patient with localized pressure, a rear component engageable with the back side of the head,

means including left and right components interconnecting said front and rear components, and means removably supported in said right and left components for engaging the left and right external auditory meatus of the patient with localized pressure,

wherein said left and right components are disc-shaped hubs with interrupted threads on their center bores and wherein said means removably supported in each of said right and left components comprise:

a bolt with interrupted helical threads and a cylindrical recess extending along its longitudinal center, and

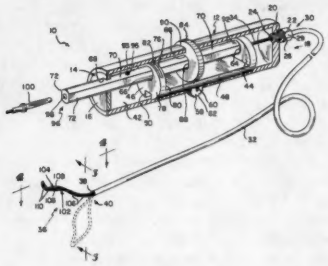
an ear bar slidably carried by said recess having a tapered tip for engaging the external auditory meatus.

4,256,113

SURGICAL APPARATUS

Dale L. Chamness, 621 Pleasant Ridge Rd., Bloomington, Ind. 47401

Filed Dec. 8, 1977, Ser. No. 858,712
Int. Cl.[3] A61B *17/36*
U.S. Cl. 128—303.14 **22 Claims**



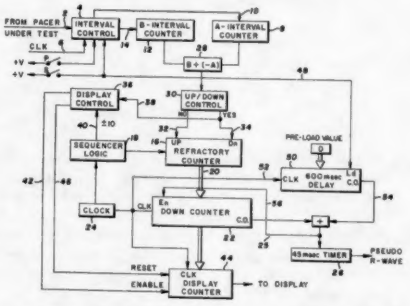
1. In a surgical apparatus including a sheath having proximal and distal ends, a snare wire extending within the apparatus and having proximal and distal ends, a loop formed at the distal end of the snare wire, and means for protracting the distal end of the snare wire including the loop from, and retracting the distal end of the snare wire including the loop into, the distal end of the sheath, the loop being formed with a double offset bend in a plane extending longitudinally of the cannula through the loop, such that partial retraction of the loop into the distal end of the sheath causes the loop to move parallel to the first plane and perpendicular to a second plane which is perpendicular to the first plane and parallel to the longitudinal extent of the cannula.

4,256,114

REFRACTORY MEASUREMENT CIRCUITRY

Scott W. Carlson, Blaine, and James T. Bartelt, Shoreview, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Oct. 24, 1979, Ser. No. 87,791
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—419 PT **9 Claims**



1. A method for measuring the refractory period of a demand-type cardiac pacer pulse generator comprising the steps of:

(a) measuring a first interval between successive output pulses from said pulse generator;

(b) applying a pseudo R-wave to said cardiac pacer at a first predetermined time following the occurrence of a pacer pulse generator output pulse;

(c) measuring an additional interval between successive

output pulses from said pulse generator following the occurrence of said pseudo R-wave;

(d) comparing said first interval measurement to said additional interval measurement to determine if said additional interval is greater than said first interval;

(e) adjusting the time of application of said pseudo R-wave to said cardiac pacer relative to pacer output pulses in predetermined increments depending upon the results of said comparing step; and

(f) repeating steps (b) through (e) until said additional interval is greater than said first interval after a predetermined number of iterations.

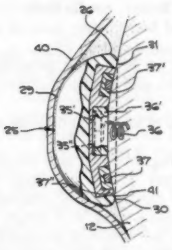
4,256,115
LEADLESS CARDIAC PACER

Michael Bilitch, Los Angeles, Calif., assignor to American Technology, Inc., Northridge, Calif.

Continuation-in-part of Ser. No. 752,266, Dec. 20, 1976, abandoned, and a continuation of Ser. No. 921,703, Jul. 3, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 111,776

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 P **9 Claims**



1. A leadless cardiac pacemaker for attachment to a heart muscle on the exterior surface beneath the pericardium, said pacemaker comprising a case of tissue compatible material having a circumferentially rounded perimeter presenting respective outer and inner faces,

said case having a smooth imperforate surface throughout its exterior with the inner face adapted to contact the heart muscle and having an area smaller than the area of the contacted portion of the heart muscle, an annular perimetrical area between said faces being transversely arcuate,

a solid state electronic pacer circuitry unit including a solid state power source hermetically encapsulated in said case,

a cathode centrally mounted in fixed position on said inner face,

said cathode comprising a contact wire with a section thereof exterior to the case being bare, said wire having a captive end in fixed position on one face of said case and electrically connected to said unit, said bare section comprising a tissue penetrating and fastening strand of material having an overall length exceeding the width by many times and projecting outwardly of said case, the penetrating and fastening strand being of resilient character

and having a muscle penetrating tip whereby upon insertion into the heart muscle the penetrating and fastening portion draws the case against the exterior of the heart muscle, and anode with an exposed portion surrounding said cathode and in fixed position on the same face of said case as said cathode,

said anode comprising a tissue contacting area mounted on the inner face of the case and in position flush with said inner face and being electrically connected to said unit,

there being an area of dielectric material on the case forming a part of said inner face separating said anode and said cathode.

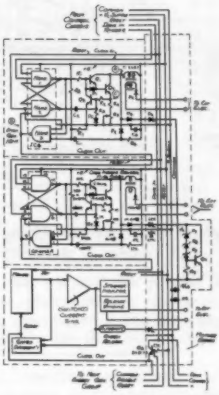
4,256,116
TRANSCUTANEOUS PAIN RELIEVER

Paul L. Meretsky, and Amiram Carmon, both of Haifa, Israel, assignors to Technion Research and Development Foundation, Limited, Haifa, Israel

Filed Jul. 3, 1978, Ser. No. 921,344

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—421 **123 Claims**



1. A transcutaneous pain reliever comprising a plurality of external electrode assemblies for supplying electric excitations to a patient, means for sequentially and individually pulsing current through said external electrode assemblies, means to prevent pulsing of current through one external electrode assembly, means responsive to the completion of a pulse from a previous external electrode assembly to pulse current through said one external electrode assembly, said external electrode assembly comprising means for inductively storing energy and means for releasing said energy to the external electrodes, said inductive storage means comprising a storage winding for storing the energy and a release winding for releasing said energy to the external electrodes.

4,256,117
CARDIAC MONITOR WITH STOP WATCH MEANS

Jacob E. Perica, 11732 Canterbury, Warren, Mich. 48093; Wayne F. Poyer, Ann Arbor, and Neale F. Koenig, Ypsilanti, both of Mich., assignors to Jacob E. Perica, Warren, Mich.

Division of Ser. No. 662,540, Mar. 1, 1976, Pat. No. 4,096,854. This application Jun. 26, 1978, Ser. No. 918,828

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—690 **3 Claims**

1. In combination:

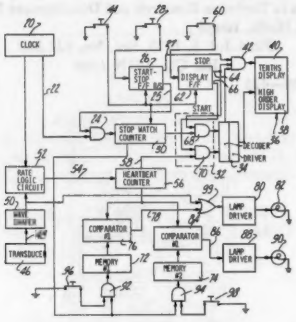
a digital stop watch, said stop watch comprising a stop watch counter, a clock and switch means for selectively feeding said clock output into the input of said stop watch counter so that the count in the stop watch counter is representative of the elapsed time from the actuation of said switch means, display means and means for selectively displaying the count in said counter on said display means, and

a body worn cardiac monitor comprising:

transducer means secured to the body of the wearer and adapted to detect heart beats and to produce an electrical signal representative thereof,

means for receiving the signals from said transducer means

and producing a heart beat rate signal representative of the heart beat rate per unit time, and



multiplex means for selectively displaying either the count in said stop watch counter or the heart beat rate on said display means.

4,256,118

APPARATUS FOR THE DETECTION AND RECORDING OF UTERINE ACTIVITY

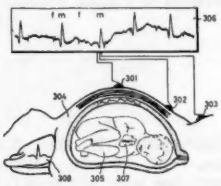
Joachim Nagel, Erlangen, Fed. Rep. of Germany, assignor to Biotronik Mess-und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,381

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2732160

Int. Cl.[3] **A61B** *5/04*

U.S. Cl. 128—733 **22 Claims**



1. Apparatus for detecting and recording the uterine pressure of a subject, comprising:

detection means for effecting electromyographic detection of electrical fields inherent in muscular activity in the abdominal area of the subject and for producing a corresponding signal;

generating means connected to the output of said detection means for generating a signal which corresponds to the intensity of the alternating voltage component of the electromyographically detected signal at the output of said detection means;

means connected to said signal generating means for averaging in time the signal which corresponds essentially to the intensity of the alternating voltage component of the electromyographically detected signal; and

emitting means connected to said averaging means for emitting a representation of the time averaged signal as a measure of the intrauterine pressure.

4,256,119

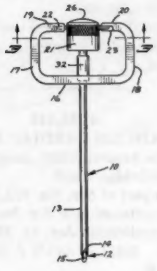
BIOPSY NEEDLE

Thomas E. Gauthier, Rochester, Minn., assignor to Gauthier Industries, Inc., Rochester, Minn.

Filed Sep. 17, 1979, Ser. No. 76,069

Int. Cl.[3] **A61B** *10/00*

U.S. Cl. 128—754 **11 Claims**



1. A biopsy needle comprising:

(A) an elongated hollow needle body having proximal and distal ends, said body being open at each end, and the distal end defining a cutting edge,

(B) an elongated stylet having proximal and distal ends positioned within said needle body with distal ends adjacent,

(1) the distal end of said stylet defining a penetrating edge, and

(2) a knob having proximal side and distal side surfaces rigidly attached to the proximal end of the stylet,

(C) an open loop handle rigidly attached to the proximal end of said needle body, said handle comprising:

(1) a transverse bar disposed generally perpendicular to the longitudinal axis of said needle body and stylet,

(2) a pair of spaced apart side bars extending upwardly in the proximal direction from the ends of said transverse bar, and

(3) a pair of upper bar segments having proximal side and distal side surfaces extending inwardly from the upper ends of said side bars toward the longitudinal axis extending through the needle body, the inner ends of said bar segments being spaced apart to receive the knob of the stylet, and

(D) locking means for securing said stylet within the needle body and handle and comprising:

(1) a pair of locking elements extending radially from the opposite sides of the stylet knob, and

(2) a pair of recesses in the inside distal side surfaces of the spaced apart ends of the upper handle bar segments engageable with said locking elements.

4,256,120

FLUID SAMPLE COLLECTION DEVICE

Michael J. Finley, Richmond Heights, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

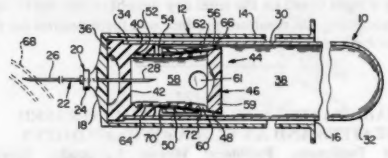
Filed Jan. 7, 1980, Ser. No. 109,952

Int. Cl.[3] **A61B** *10/00*

U.S. Cl. 128—764 **16 Claims**

1. A blood sample collection device adapted to receive a blood sample and to be centrifuged for separating the blood phases comprising an evacuated container, a stopper closing one end of said container, and a valve in said container between said stopper and the opposite end of said container defining a first chamber between said stopper and said valve, and a second chamber between said valve and said opposite end of said container, said stopper being pierceable by a needle for connecting a source of blood in fluid communication with said first chamber, said valve being responsive to fluid communication with said source of blood to open said valve and allow

blood to flow therethrough to said second chamber, and valve securing means in said container responsive to centrifugal



forces upon centrifugation of said container to maintain said valve closed during continued centrifugation of said container.

4,256,121

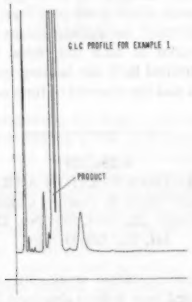
USE OF 2-OXABICYCLOOCTANE DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLES

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 12,695, Feb. 16, 1979, Pat. No. 4,195,100, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Jun. 15, 1979, Ser. No. 49,205

Int. Cl.[3] A24B *3/12*

U.S. Cl. 131—9 **3 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with a smoking tobacco an aroma or taste augmenting or enhancing quantity of at least one oxabicyclo compound selected from the group consisting of:

(i) 3-ethyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane;
(ii) 3-n-butyl-1,4-dimethyl-2-oxabicyclo[2.2.2]octane;
(iii) 3-isopropyl-1,5-dimethyl-2-oxabicyclo[2.2.2]octane;
(iv) 3-n-butyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane;
(v) 5-ethyl-1,5-dimethyl-3-n-propyl-2-oxabicyclo[2.2.2]octane;
(vi) 3-methallyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane; and
(vii) 3-isopropyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane.

4,256,122

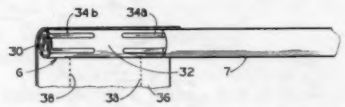
CIGARETTE FILTER

Robert R. Johnson, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Apr. 11, 1979, Ser. No. 29,230

Int. Cl.[3] A24D *3/04*

U.S. Cl. 131—10 A **9 Claims**



1. A filter for a cigarette comprising:

A porous filter rod of cylindrical configuration;

A smoke impervious wrapper extending longitudinally along said rod from one end thereof and circumscribing said rod leaving flow-through apposed ends of said rod, said wrapper having a plurality of longitudinally extending grooves circumferentially spaced therearound embedded into the filter rod and that portion of the wrapper defining the grooves remaining smoke impervious, said grooves being open ended at and extending from one of said ends a distance less than the length of the filter rod; and,

tipping material extending longitudinally of and circumscribing said wrapper, said tipping material being air pervious and permitting ventilating air flow there through into said grooves, said ventilating air being the only fluid flowing through said groove when the filter is used in combination with a cigarette during normal smoke draw.

4,256,123

SMOKABLE MATERIAL CONTAINING THERMALLY DEGRADED TOBACCO BY-PRODUCTS AND ITS METHOD OF PREPARATION

Andrew T. Lendvay; Helmut R. R. Wakeham, and Gus D. Keritsis, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,331

Int. Cl.[3] A24B *3/14, 15/18;* A24D *1/18*

U.S. Cl. 131—17 A **22 Claims**

1. A method of producing a smokable material comprising:

(a) subjecting a material consisting essentially of tobacco by-products to uncatalyzed pyrolysis to produce a weight loss of about 40 to 90%;
(b) adding the pyrolyzed material to a slurry consisting essentially of tobacco-parts;
(c) homogenizing the slurry; and
(d) drying.

4,256,124

METHOD AND APPARATUS FOR MANUFACTURING FILTER CIGAR

D. Bernard Higgins, Berwick, Pa., and Frederick D. Godfrey, Jr., Maplewood, N.J., assignors to Gulf & Western Corporation, New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,611

Int. Cl.[3] A24C *1/32, 5/47*

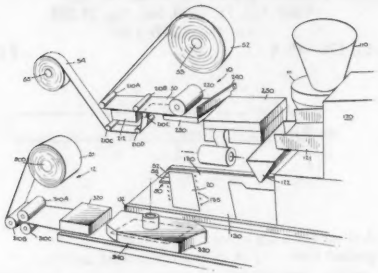
U.S. Cl. 131—29 **27 Claims**

1. A method for manufacturing a cigar bunch having a preformed cigar filter and a tobacco filler charge wrapped in a sheet of cigar binder material and having a reinforcement strip wrapped over the interface between said filter and said filler charge, said method comprising the steps of:

introducing onto a cigar bunch rolling table a preformed cylindrically shaped cigar filter, a tobacco filler charge, a sheet of cigar binder material and a reinforcement strip; and

rolling said binder material and reinforcement strip into said

rolled bunch about said filter and filler charge while compressing said filter against said filler charge by inserting a locating element to form a cigar bunch, said binder being



spirally wrapped about said filter and filler charge and said reinforcement strip being circumferentially wrapped over the interface between the filter and the filler charge.

4,256,125

CIGARETTE MAKING MACHINE

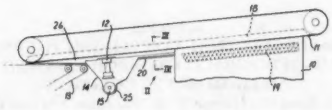
Francis A. M. Labbe, Neuilly sur Seine, France, assignor to Molins Limited, England

Filed Jun. 8, 1979, Ser. No. 46,920

Claims priority, application United Kingdom, Jun. 13, 1978, 26816/78

Int. Cl.[3] **A24C** *5/18*

U.S. Cl. 131—66 R **6 Claims**



1. In a cigarette making machine including an air-pervious band, a shower channel through which such air-pervious band passes and in which tobacco is showered towards the band with the aid of an air stream to form a cigarette filler stream on the band, means for inducing the air stream at least partly by suction acting through the band to hold the tobacco against the band, whereby there is also suction pressure in the channel in an area adjacent to the band, the improvement comprising a partly-tubular casing outside said shower channel which covers the cigarette filler stream as it leaves the shower channel, and means including inclined air inlets formed in said casing for inducing air streams into the part-tubular casing in directions having components in the direction of movement of the cigarette filler stream.

4,256,126

SMOKABLE MATERIAL AND ITS METHOD OF PREPARATION

Robert B. Seligman, and Gus D. Keritsis, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,332

Int. Cl.[3] **A24B** *15/12, 15/16, 15/24, 15/42*

U.S. Cl. 131—17 A **31 Claims**

1. A method of producing a smokable material which comprises:

(a) pyrolyzing a carbohydrate material to a weight loss of at least 10%;

(b) forming a slurry of tobacco-parts;

(c) adding the pyrolyzed carbohydrate material to the slurry;

(d) homogenizing the slurry;

(e) adding an alkali metal salt selected from the group consisting of an alkali metal salt of a lower carboxylic acid, carbonate, bicarbonate, and phosphate to the homogenized slurry in an amount in the range of about 0.3 to 10% by weight based on the total dry weight of the slurry; and

(f) processing the resultant product to a form desired for the smoking material.

4,256,127

HAIR WAVING APPLIANCE WITH INFRARED HEATERS AND AN ULTRASONIC ATOMIZER

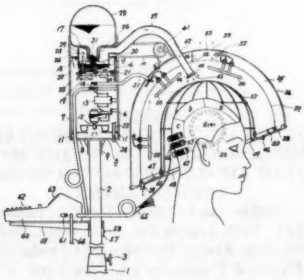
Susumu Tsujimoto, Fujiidera; Hayao Yamazaki, Ikoma; Masayoshi Ozaki, Kawachinagano, and Takehiro Kobayashi, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1977, Ser. No. 862,964

Claims priority, application Japan, Dec. 27, 1976, 51-158479

Int. Cl.[3] **A45D** *20/20, 20/38;* **H05B** *3/02;* **A45D** *20/22*

U.S. Cl. 132—9 **37 Claims**



1. A hair waving apparatus comprising:

a hood assembly adapted to be positioned around the head of a user;

a plurality of electrically operated heating means provided within said hood assembly for heating a plurality of different hairline areas of the head of a user; and

a plurality of electrical controlling means individually operatively connected to each individual heating means to individually control both the heating temperature of each heating means and the interval of time each heating means is activated.

4,256,128

TOLL COLLECTION STATION ARRANGEMENT

Arthur B. Chiappetti, 10600 S. Oakley, Chicago, Ill. 60643

Filed Mar. 22, 1979, Ser. No. 22,679

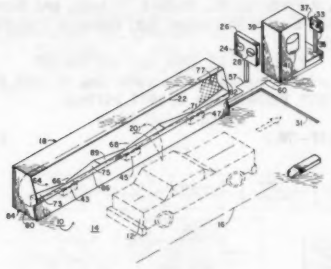
Int. Cl.[3] **G07D** *9/04*

U.S. Cl. 133—8 E **10 Claims**

1. In a toll collection station arrangement including means defining an elongated lane indicia disposed for defining a toll collection lane along a roadway for guiding vehicles therethrough to charge tolls for their use of the roadway, toll collection receptacle means disposed at the elongated lane indicia for receiving currency propelled from the vehicles, said receptacle means having counting means for said currency, said arrangement comprising:

said receptacle means having an elongated currency receiving mouth extending parallel to the lane at one side thereof and opening in the direction facing the vehicle for receiving the currency from a moving vehicle as it moves opposite said receptacle means, and currency moving means for moving rapidly the currency from different axially spaced apart portions of said mouth to said counter means so that said counter means can determine the total of the deposited currency before the moving vehicle leaves said receptacle means and another moving vehicle moves

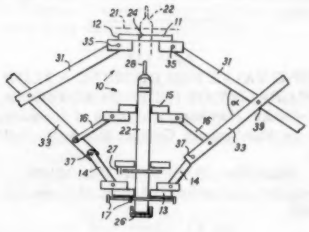
opposite said receptacle means; said currency moving means including at last one conveyor belt means for transporting at a high rate of speed said currency to said counter means.



4,256,129
TENT ROOF STRUCTURE

John T. Gilsenan, Broxmore, Cliftonville, Dorking, Surrey, England

Filed Apr. 16, 1979, Ser. No. 30,684
Claims priority, application United Kingdom, Apr. 21, 1978, 15806/78
Int. Cl.³ A45F *1/16*; E04B *1/347*
U.S. Cl. 135—4 R **8 Claims**

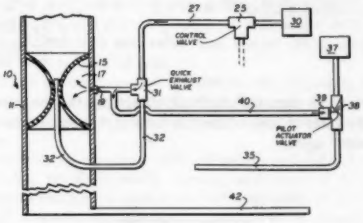


1. A tent roof structure comprising a plurality of collapsible roof struts, each strut having a first strut member and a second strut member, first and second central carrier members, said first and second strut members being pivotally connected to a respective one of said first and second central carrier members, said first and second central carrier members being arranged for relative displacement towards each other, and axial coupling means to align axially said first and second central carrier members in a first position and in which first position the collapsible roof struts extend outwardly from said first and second central carrier members, in a second position thereof said first and second central carrier members are axially displaced from one another to enable said struts to adopt a folded attitude in which the first and second strut members extend substantially axially of the first and second carrier members, wherein each of the first and second central carrier members comprises a plate-like member, a central aperture in each plate-like member, a plurality of angularly spaced compartments on each plate-like member, first and second abutments on each compartment to limit the movement of a respective first strut member beyond the position occupied by that member in said first and second positions of the carrier members, and wherein the second central carrier member further comprises a further plate-like member, a central aperture in said further plate-like member, a plurality of angularly spaced compartments in said further plate-like member, first and second abutments on said further plate-like member to limit the movement of a respective second strut member beyond the position occupied by that member in said first and second positions of the carrier members, wherein a first link connects each second strut member to the plate-like member of the second central carrier and a second link connects each second strut member to the further plate-like member of the second central carrier, whereby said first and second links assist in maintaining rotational stability of the struts about the central carrier members.

4,256,130
PNEUMATIC VALVE CONTROL FOR TEXTILE MACHINERY BLOWDOWN

James B. Smith, and Craig B. Whitney, both of Charlotte, N.C., assignors to Pneumafil Corporation, Charlotte, N.C.

Filed Aug. 22, 1978, Ser. No. 936,573
Int. Cl.³ E03B *1/00*
U.S. Cl. 137—1 **6 Claims**



5. A method of operating a blowdown system for textile machinery having a blowdown line directing air to a selected location with respect to a textile machine, and a suction line spaced from said blowdown line, with a pneumatic valve having a flexible annulus in a rigid conduit with an actuating space between annulus and conduit, said valve in an air handling system coupled to the suction line, said method comprising the steps of supplying fluid under pressure to the valve actuating space; valving the flow of supplied fluid from a point relatively remote from the pneumatic valve to be controlled; and providing exhaust means adjacent the pneumatic valve for quickly releasing the fluid under pressure in the actuating space upon a drop in supply pressure beneath a given magnitude, and in which air flow through the blowdown line is valved; and the valving is controlled in response to the pressure in the pneumatic valve actuating space.

4,256,131
FEEDBACK COLOR CONTROL SYSTEM

Joseph De Remigis, New Market, Canada, assignor to Sentrol Systems Ltd., Downsview, Canada

Continuation of Ser. No. 704,992, Jul. 14, 1976, abandoned. This application Sep. 8, 1978, Ser. No. 940,566
Int. Cl.³ G01N *21/30*; G05D *11/13*
U.S. Cl. 137—3 **14 Claims**

13. A method of controlling the flows of two preselected transparent colorants used to color a continuously formed material, comprising:

providing a first signal as a substantially continuous function of measured color saturation of the material;

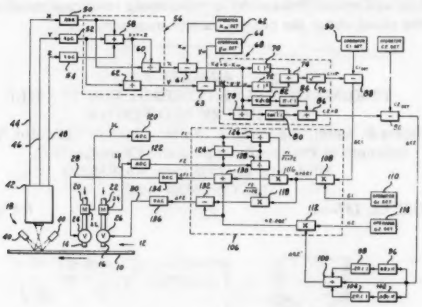
providing a second signal as a substantially continuous function of measured hue of the material, said first and second signals defining a coordinate system in the x-y chromaticity plane in which lines of constant hue radiate outwardly from a predetermined chromaticity point and in which lines of constant saturation extend around said point;

obtaining a first error signal in response to said first signal representing deviations in said measured saturation from a desired saturation;

obtaining a second error signal in response to said second

signal representing deviations in said measured hue from a desired hue;

varying in the same algebraic direction the magnitudes of the rates of flow of the colorants in response to the first error signal; and



varying in opposite algebraic directions the magnitudes of the rates of flow of the colorants in response to the second error signal.

4,256,132

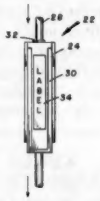
SAFETY DEVICE FOR CLAMP FOR MEDICAL SOLUTION ADMINISTRATION SYSTEMS

Richard C. Gunter, 93-40 Cullen Pkwy., Crisfield, Md. 21817

Filed Dec. 7, 1978, Ser. No. 967,166

Int. Cl.³ F17D *1/16*

U.S. Cl. 137—14 **17 Claims**



1. A method of providing safety in the operation of flow control clamps of medical solution administration systems having a tube-like connection from the medical solution supply to the patient with a flow control clamp situated along said tube-like connection, comprising, integrally and monolithically attaching one end of a safety cover to one end of a flow control clamp, laying said safety cover over an exposed operating mechanism in the body of said flow control clamp to prevent said operating mechanism from being exposed to ready access, and removably attaching by a snap fit juncture the other end of said safety cover to the other end of said flow control clamp so as to require deliberate delaying action to obtain subsequent access to said operating mechanism, thereafter inscribing the identification of a medical solution on a label on exterior of said safety cover thereby causing ready identification of said medical solution administration system when access to said operating mechanism is subsequently sought.

4,256,133

WATERING VALVE DEVICE

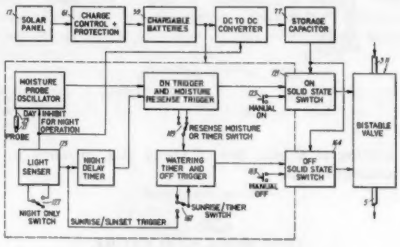
Noel D. Coward, 3 Withers Ave., Mulgrave, Victoria; Donald G. Collins, 9 Frederick St., Bulleen, Victoria, and Kenneth H. Gambling, Unit 3, 86 Graham Rd., Rosanna, Victoria, all of Australia

Filed Aug. 22, 1978, Ser. No. 936,567

Claims priority, application Australia, Aug. 22, 1977, PD1327; Nov. 15, 1977, PD2422; Dec. 5, 1977, PD2663

Int. Cl.³ A01G *25/16*

U.S. Cl. 137—78.3 **8 Claims**



1. A water flow control device including an on-off valve, a moisture probe for detecting the moisture content of ground to be watered, and circuit means responsive to said moisture probe, said moisture probe being adapted to actuate a first timing means of said circuit means for a first predetermined time after said moisture probe has reached a predetermined moisture content, and thereupon to close said valve.

4,256,134

REGULATING VALVE FOR DIVIDING A FLOW INTO A PLURALITY OF INDIVIDUAL FLOWS

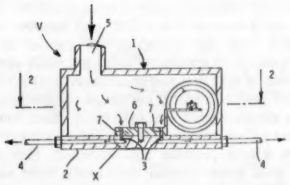
Manfred Redetzky, Hamburg, Fed. Rep. of Germany, assignor to Klöckner Stahltechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 24,979

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813851

Int. Cl.³ G05D *7/01*

U.S. Cl. 137—118 **3 Claims**

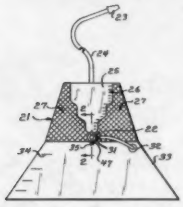


1. A regulating valve for dividing supplied liquid and gaseous media into a plurality of equal individual flows, characterized in that the valve comprises a stationary base provided with a multiplicity of bores of the same diameter, and a superposed rotatable perforated disk having a plurality of bores adapted to be placed in registry with the bores of the base, in which the bores of the valve base and the perforated disk coincide in a fully opened state, and a pressure responsive member acted upon by the supplied media and connected to drive the perforated disk such that flow through all of the bores is equally adjusted, whereby adjustment of the rotatable perforated disk takes place automatically in dependency of the supplied media flow to obtain simultaneous equal flow through the bores.

4,256,135
HIGH FLOW LINED VALVE FOR MEDICAL APPLICATIONS

Richard E. Hannah, Spring Grove, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 16, 1979, Ser. No. 21,094
Int. Cl.[3] F16K 5/02
U.S. Cl. 137—375 25 Claims

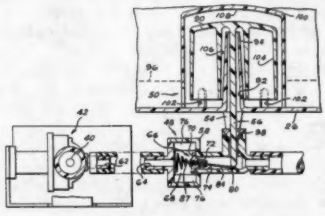


1. A lined valve assembly for medical applications, comprising: a valve body member having a plurality of ports passing through the body member; a valve plug member having a plug portion extending into said valve body member; a liner generally interposed between said valve body member and said plug member; resilient means on said liner for providing lines of sealing between said liner and said valve body member and for defining a flow path through the valve assembly, said resilient means including a plurality of resilient raised portions on said liner; said flow path being selectively positioned by movement of said valve plug member with respect to said valve body member; and means for assembling said valve plug member and said valve body member to each other.

4,256,136
MECHANICALLY OPERATED LEVEL CONTROL FOR DISHWASHERS

John G. Crawford, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 970,825, Dec. 18, 1978, abandoned.
This application May 1, 1980, Ser. No. 145,524
Int. Cl.[3] F16K 31/34
U.S. Cl. 137—387 8 Claims



1. In a dishwasher of the type having a water collecting tub, liquid supply means including an electrically operated fill vavle means for providing controlled in-flow of liquid to the tub in response to a timing device, and means for draining liquid from the tub; a liquid level control arrangement for providing a predetermined amount of liquid to the tub, said level control arrangement comprising:

(a) float means disposed within the buttom region of said tub, said float means being constructed and arranged to be raised and lowered in response to the rising and falling, respectively, of the liquid level in the tub, said float means moving to a full position when the liquid level in the tub rises to a predetermined full level;

(b) a two-stage level control valve means interposed in the liquid supply means downstream of the fill valve means and including a valve housing having a valve seat formed therein, and a valve head with an integrally formed stem, said valve head having an upstream pressure relief port and a downstream seat engagement surface adapted for selective sealing engagement with said seat to close said valve, said stem having an internal passageway extending axially therethrough in fluid communication with said pressure relief port;

(c) actuating means constructed and arranged to operatively couple said level control valve means and said float means, said actuating means including an actuating member extending through said internal passageway in said valve head, said actuating member being movable between a sealing position in which said valve head is in sealing engagement with said valve seat and said one end is in sealing engagement with said pressure relief port, a first stage position in which said one end of said actuating member is out of sealing engagement with said pressure relief port and a second position in which said actuating member positions said valve head out of sealing engagement with said valve seat;

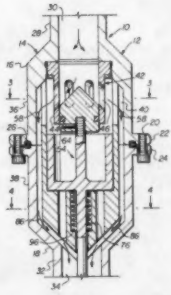
(d) biasing means operative to position said actuating member in its sealing position when said float means is in its full position thereby preventing further in-flow of liquid to the tub;

(e) means interconnecting said float means and said actuating member for sequentially moving said actuator member from its sealing position to its first stage position and then to its second stage position in response to the liquid level in the tub falling below the full level as the liquid is removed from the tub by the drain means; whereby the control valve means is closed when the liquid level in the tub rises to said predetermined full level and is opened in two sequential stages of operation as liquid is drained from the tub.

4,256,137
CHECK VALVE

Paul de Launay, 119 W. Farrell, Lafayette, La. 70508

Filed Mar. 19, 1979, Ser. No. 21,505
Int. Cl.[3] F16K 15/02
U.S. Cl. 137—496 14 Claims



1. A check valve for use in flow line, comprising:

a valve body including

a first portion having

an inlet with a passage for

carrying fluid from the flow line and

an outlet with a passage for carrying fluid back to the flow line, the inlet and outlet passages being substantially aligned with one another, and

a second portion having

a tubular member with a longitudinal passage for receiving fluid from the inlet passage and with outlet

ports extending radially from the longitudinal passage and

a flange extending annularly around the tubular member with a surface facing the outlet of said first portion;

a plunger mounted with said valve body for checking fluid flow through said valve, said plunger including

a plug mounted in the longitudinal passage of said tubular member and movable with said plunger from a first deflecting position wherein said plug deflects the flow of fluid out of alignment with the inlet passage and through said outlet ports to a second checking position wherein said plug sealingly checks flow through the valve; and

a tubular sleeve circumscribing said tubular member with an engaging shoulder; and

a spring mounted with said valve body for urging said plunger toward the inlet passage, the plug moving through the longitudinal passage of said tubular member and the shoulder of said tubular sleeve moving toward the flange surface when the pressure of the fluid in the inlet passage is insufficient to overcome the urging of said spring which thereby checks the flow of fluid through the valve.

4,256,138

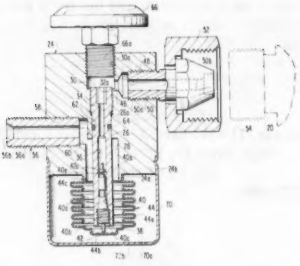
PRE-SET FLUID PRESSURE REGULATOR

Ernest M. Chapman, Rte. #1, Box 349P, Springfield, Vt. 05156

Filed Feb. 11, 1980, Ser. No. 120,032

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—505.42 **4 Claims**



1. An improved pre-set fluid pressure regulator comprising:

a regulator body,

a longitudinal bore within said body,

a tubular adjustor,

means for sealably mounting said adjustor within said bore for axial adjustment,

a tire valve sealably mounted within said tubular adjustor at one end thereof,

a fluid inlet passage for transmitting said fluid to said valve at a first pressure,

a fluid outlet passage for transmitting said fluid from said valve at a second, lower pressure,

an expandable and contractable closed bellows sealably fixed to said regulator body concentric with said adjustor and said tire valve and having one end spanning across the end of said tire valve, said tire valve bearing an axially displaceable valve stem with the end of said tire valve stem projecting axially beyond the end of said tubular adjustor and contacting the end of said bellows, and

means for connecting said outlet passage to the interior of said bellows,

said tire valve being between said fluid inlet passage and said fluid outlet passage and acting in a continuing fashion to reduce said first pressure to said second pressure, such that axial adjustment of said adjustor functions to variably pre-set the outlet pressure for said regulator.

4,256,139

VALVE ASSEMBLY FOR HIGH-PRESSURE PISTON PUMP

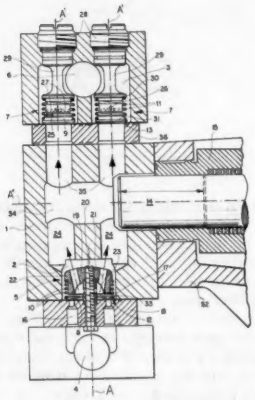
Adalbert Huperz, Hockenheim, and Wolfgang Maasberg, Hünxe-Krudenburg, both of Fed. Rep. of Germany, assignors to Woma-Apparatebau, Duisburg, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,542

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745470

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—512.3 **8 Claims**



1. A valve assembly for a high-pressure pump, said assembly comprising:

a housing having a housing surface and a planar internal surface and formed with an exhaust port and with a generally annular intake port for said pump opening respectively at said housing surface and at said planar surface;

a first abutment in said housing having a planar annular abutment surface turned toward, parallel to, and spaced from said planar internal surface at said intake port;

an annular valve disk having a pair of opposite planar disk surface and displaceable in said housing between a closed position with one of said planar disk surfaces engaged sealingly with said internal surface over said annular intake port and an open position spaced from said intake port and with the other of said planar disk surfaces resting against said annular abutment surface;

a first spring having one end fixed in said housing and another end carrying and acting substantially as the sole support for said disk, said spring urging said disk into said closed position;

a valve body sealingly engageable with said housing surface over said exhaust port;

a second abutment having a second abutment surface against which said valve body rests in an open position thereof and formed with at least one throughgoing passage opening at said second abutment surface; and

a second spring carrying and acting substantially as the sole support for said body, said other spring urging said body toward said housing surface.

4,256,140

TWO-PIECE HOT RUNNER MANIFOLD

Nareshwar Swaroop, Mt. Vernon, Ohio, and Frederick L. Stone, Woodbury, Conn., assignors to The Continental Group, Inc., New York, N.Y.

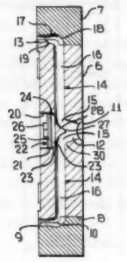
Filed Dec. 6, 1979, Ser. No. 100,804

Int. Cl.³ B29F *3/04*

U.S. Cl. 137—561 A **7 Claims**

1. A hot runner manifold for coupling a plasticizer to a plural

cavity mold, said manifold having defined therein a central primary sprue opening inwardly into said manifold from one face thereof for receiving plastic material from a plasticizer nozzle, a plurality of secondary sprues opening outwardly from said manifold from an opposite face thereof, a runner extending from said primary sprue to each of said secondary sprues, said secondary sprues being arranged on a common



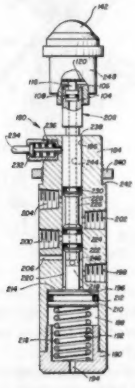
circle, said manifold comprising a circular path having a stepped periphery, a part of said periphery lying on said common circle, and a ring member telescoped over said plate, said secondary sprues being in part formed in said plate and in part formed in said ring, and said ring and said plate having an interference fit of a degree for maintaining said plate and said ring assembled at normal operating temperatures and pressures.

4,256,141

RELAY VALVE FOR FLUID ACTUATORS

Clifford M. Peters, Longview, Tex., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Jul. 13, 1979, Ser. No. 57,490
Int. Cl.³ F15B *13/01*; F16B *20/00*
U.S. Cl. 137—557 **9 Claims**



5. In a pilot operated relay valve having a valve body, a slide valve mounted in the body for longitudinal movement between an open position to direct pressurized fluid to an actuator and a closed position to bleed fluid from the actuator, means biasing said slide valve to the closed position, manually accessible means on the slide valve adapted to be manually manipulated to effect longitudinal movement of the slide valve from the closed position to the open position for manual setting of the slide valve, a piston carried on the slide valve, and a pilot port in the valve body in fluid communication with said piston in the open position of the slide valve to apply the fluid pressure of said pilot port to the piston for holding of the slide valve in the open position, the improvement comprising:

a vent port in the valve body in fluid communication with the pilot port in the closed position of the slide valve to vent fluid pressure applied to the pilot port when the slide valve is in the closed position, thereby preventing fluid pressure at the pilot port from moving the slide valve from the closed position to the open position; and

means for sealing said vent port from said pilot port in the open position of the slide valve to permit application of pilot pressure to the piston for holding of the slide valve in the open position.

7. A pilot operated relay valve for controlling flow from a fluid source to a valve actuator in response to pressure changes in a pilot line, said relay valve comprising:

a valve body presenting a longitudinal bore having an enlarged portion defining a piston chamber in the valve body;

a slide valve mounted in said bore for longitudinal movement between an open position wherein fluid is directed from said source to said valve actuator and a closed position wherein fluid is bled from the actuator, said slide valve carrying a piston thereon in the piston chamber and having an outer end portion located outwardly of the valve body;

means biasing said slide valve outwardly toward the closed position thereof;

a knob on said outer end portion f the slide valve adapted to be manually pushed to push the slide valve inwardly from the closed position to the open position for manual setting of the slide valve;

a pilot port in said valve body adapted for connection with the pilot line to sense the pressure therein, said pilot port communicating with said piston chamber in the open position of the slide valve to apply the pilot line pressure to said piston for holding of the slide valve in the open position when the pilot line pressure is sufficient to overcome the force of said biasing means;

a reduced size portion of said slide valve providing an annular chamber in said bore about said reduced portion, said pilot port communicating with said annular chamber in the open position of the slide valve;

a fluid passage in said slide valve having a port in said reduced size portion in fluid communication with said annular chamber under all conditions of operation;

visual indicator means on said knob having a first condition indicating the open position of the slide valve and a second condition indicating the closed position of the slide valve; and

means effecting the first condition of said indicator means when said passage is exposed to fluid pressure above a predetermined level and the second condition of said indicator means when the pressure in said passage is below said predetermined level.

4,256,142

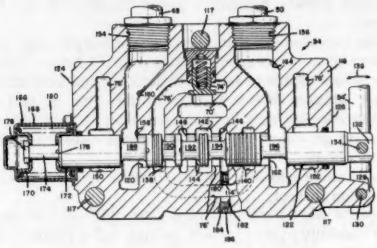
HYDRAULIC CONTROL

Leonard H. Hancock, c/o FWD Truck & Equipment, Box 1528, Harrisburg, Pa. 17105

Filed Aug. 20, 1979, Ser. No. 67,751
Int. Cl.³ F15B *13/08*
U.S. Cl. 137—596 **6 Claims**

1. An improved hydraulic control of the type used on a highway dump truck or the like including a stacked parallel circuit valve assembly having a plurality of stacked spool valve units, the units including an upstream valve unit and a downstream valve unit, a high-pressure inlet port located upstream of the upstream valve unit, a downstream high-pressure outlet port located downstream of the downstream valve unit, a spool bore and a valving spool in each valve unit, the spool having a central non-work position within the bore and work positions to either side of the central position, means for shifting the

valve from the central position to the work positions, a work port pressure line extending from said inlet port into all of said valve units and communicating with the spool bores of said valve units, a pressure fluid return line communicating with the valve bores of said valve units for returning pressure fluid therefrom outwardly of the valve, a pair of work ports on each valve unit adapted to be connected by hydraulic lines to a primary hydraulic device, a high-pressure carryover passage extending from the inlet port through the spool bores of said valve units to said outlet port, each spool valve including means for closing said high-pressure carryover passage upon shifting of the spool from the central position to a work position and for opening said high-pressure carryover passage when the spool is in the central position, and a high-pressure control line communicating the portion of the work port pressure line in the downstream valve unit adjacent the spool bore of said such unit with the portion of the high-pressure carryover in such unit located between the spool bore of such unit and the outlet port, said high-pressure control line including a restricted orifice for limiting the flow of hydraulic fluid from the inlet port through the work port pressure line, high-pressure control line and the downstream portion of the high-pressure carryover passage to the outlet port whereby upon connection of a source of high-pressure hydraulic fluid to the inlet port and connection of primary hydraulic devices to each of said valve units and connection of downstream hydraulic device to the outlet port, pressure hydraulic fluid is supplied to the downstream hydraulic device through the high-pressure control line when one of the valve units is shifted to a work position to operate a primary hydraulic device and thereby close the high-pressure carryover passage.



4,256,143

SHUT-OFF DAMPER

Robert J. Magill, Whitstable, and Sydney J. Field, Ashford, both of England, assignors to Actionair Equipment Limited, Whitstable, England

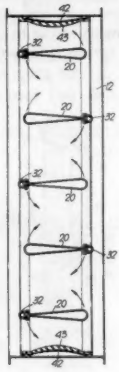
Filed Nov. 13, 1979, Ser. No. 94,186

Claims priority, application United Kingdom, Nov. 22, 1978, 45677/78

Int. Cl.[3] **F16K** *13/00*

U.S. Cl. 137—601 **13 Claims**

1. A shut-off damper comprising: (a) a frame defining an opening; (b) a line of blades which are supported in and surrounded by said frame for rotary motion about substantially parallel axes to open and close the opening in said frame; (c) at least two thin springy sealing strips made of a relatively hard and strong material arranged at the ends of said blades; and (d) respective coverings of a relatively soft resilient material on said strips, each covering being between the strip it covers and adjacent ends of said blades, whereby the end portions of said blades make sealing contact with said coverings to hinder the leakage of fluid past said blades when they are in their fully closed positions.



4,256,144

LEVER CONTROL FOR HYDRAULIC CONTROL CIRCUITS

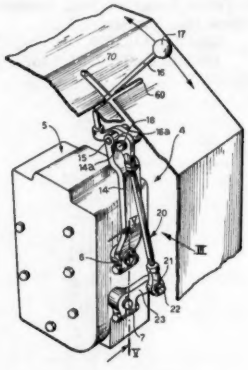
Rino O. Barbagli, Borgaretto, Italy, assignor to Fiat-Allis Macchine Movimetno Terra S.p.A., Lecce, Italy

Filed Sep. 29, 1978, Ser. No. 947,262

Claims priority, application Italy, Oct. 6, 1977, 69226 A/77

Int. Cl.[3] **F16K** *11/18;* **G05G** *9/02*

U.S. Cl. 137—636.2 **9 Claims**



1. A lever control for effecting the actuation of control valves operable to control the flow of pressurized hydraulic fluid in fluidic circuits comprising

at least two control valves each separably movable for controlling the flow of hydraulic fluid in a fluidic circuit,

at least two rotatable control shafts each mutually exclusively operatively connected to one of said control valves for effecting hydraulic fluid flow controlling movement thereof in response to rotational movement of one of the control shafts,

a control lever movable in at least two separate paths of movement for effecting mutually exclusive rotational movement of said rotatable control shafts,

a radial arm secured to each of said rotatable control shafts and extending outwardly therefrom for effecting rotational movement thereof,

a first one of said radial arms terminating in a bifurcated distal end portion and having pivotal support forming means extending between the bifurcated end portion,

said control lever supported upon said pivotal support forming means for pivotal movement relative thereto and having a distal end extending outward therefrom,

said first one of said radial arms movable to effect rotational movement of said rotatable control shaft secured thereto in response to movement of said control lever in a first path of movement,

a second one of said radial arms secured to the other of said rotatable control shafts and extending outwardly therefrom and being operatively connected to the distal end of said control lever which extends outwardly from said pivotal support forming means between said control lever and said first one of said radial arms, and

said second one of said radial arms movable to effect rotational movement of said rotatable control shaft secured thereto in response to movement of said control lever in a second path of movement.

4,256,145

IMPACT TYPE TOOLS

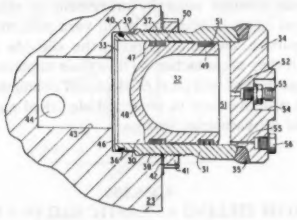
Reginald A. Phillips, Skelmersdale, England, assignor to Dobson Park Industries Limited, England

Continuation of Ser. No. 763,473, Jan. 28, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 935,047

Claims priority, application United Kingdom, Jan. 29, 1976, 3446/76

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—31 **15 Claims**



1. In combination

(i) a pressure-fluid accumulator comprising a cylinder for mounting to a connector block having passage means for feed and return of pressure fluid to a tool, said cylinder having a first end and a second end, the first end being open and being adapted for connection to the connector block to communicate with one of said passage means, the second end being closed by a cover, a hollow piston slidable longitudinally in said cylinder and sealed thereto in fluid-tight manner, said hollow piston and said cylinder and said cylinder cover together bounding a gas space, and valve means on said cover communicating with said gas space for charging said gas space with gas at a predetermined pressure; and

(ii) a connector block threadingly engaged with the accumulator and having passage means for feed and return of pressure fluid to a tool, said connector block including a recess bounded by a shoulder, and said cylinder being secured in said recess with the open end of the cylinder facing said shoulder, such that said shoulder may be abutted by said piston to limit travel of said piston in the direction towards the open end of the cylinder.

4,256,146

FLEXIBLE COMPOSITE TUBE

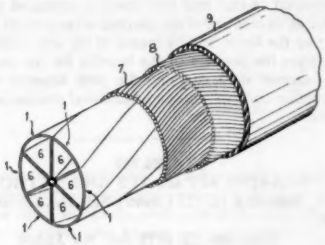
Maurice Genini, Creteil; Christian Athe, Le Mee, and Jean-Paul Aubert, Puteaux, all of France, assignors to Coflexip, Ruell Malmaison, France

Filed Feb. 21, 1979, Ser. No. 13,178

Claims priority, application France, Feb. 21, 1978, 78 04885

Int. Cl.³ F16L *9/18*

U.S. Cl. 138—111 **4 Claims**



1. A composite flexible tube comprising a central alveolar element, an external watertight sheath, and a sheet of metal between said central alveolar element and said external watertight sheath,

wherein said central alveolar element comprises a plurality of hollow metal elements, the cross-section of each of the hollow metal elements having the appearance of a triangle, wherein each hollow metal element is disposed side by side, whereby the line of intersection of each apex of each hollow metal element extends along the longitudinal axis of the tube, and wherein each of the hollow metal elements is formed of a folded, unsoldered metal sheet, said hollow metal elements being wound in a helix.

4,256,147

WEAVING LOOM

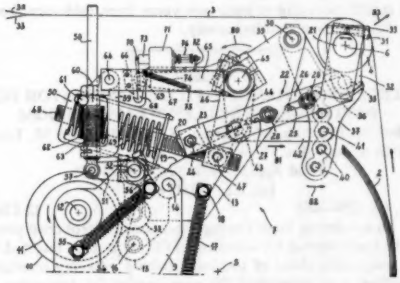
Albert H. Deborde, Bourgoin-Jailleu, France, assignor to Saurer - Diederichs Société Anonyme, Bourgoin-Jailleu, France

Filed Jul. 20, 1979, Ser. No. 59,146

Claims priority, application France, Jul. 24, 1978, 78 22882

Int. Cl.³ D03D *49/12*

U.S. Cl, 139—115 **8 Claims**



1. A weaving loom provided with a system for controlling oscillation of a warp yarn support roller,

said system comprising on at least one side of the loom, a rotary first cam mounted on a first shaft, said first cam actuating an oscillating first lever connected to an arm integral with a second shaft, the yarn support roller being mounted on said second shaft resting, through the intermediary of a raising member, in a bearing supported by a second lever pivoted about a fixed pivot and connected

through the intermediary of a connecting rod to a third lever keyed to a third shaft subject to the action of at least one spring, said system including a device for preventing differences in warp yarn at the time of starting-up the loom,

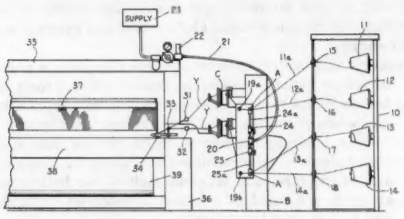
and said device comprising a second rotary cam mounted on the first shaft and actuating an oscillating fourth lever connected to a pivoted arrangement, a fifth lever being keyed to the third shaft subject to the action of said spring, hooking means controlled by an electromagnet being provided so that said fifth lever is entrained at the same time as an element of the pivoted arrangement upon starting up the loom, and by means of the said connecting rod changes the position of the bearing for the oscillation of the second shaft carrying the yarn support roller, in a direction corresponding to additional tension on the warp yarn.

4,256,148

WEAVING APPARATUS AND METHOD

Henry E. Scharling, II, 123 Country Side Dr., Greenwood, S.C. 29649

Filed Apr. 23, 1979, Ser. No. 32,564
Int. Cl.³ D03D *47/34*
U.S. Cl. 139—450 **2 Claims**



1. Apparatus for weaving fabric of compacted yarn formed from at least four yarn packages carried by a creel adjacent a loom having filling insertion means comprising:

at least two air jet devices for receiving a plurality of yarns from said creel and uniting said yarns into a single yarn;

means mounting said air jet devices at the loom;

an air supply for said air jet devices which is discontinued when said loom is stopped;

at least two yarn feeders serving a said yarn feeding and delivering means; and

a rapier receiving at least two yarns from said yarn feeders for insertion simultaneously.

4,256,149

ELECTROMECHANICAL FILLING INDICATOR FOR PATTERN-CONTROLLED WEAVING LOOM

Arthur H. Franklin, Morganton, N.C., assignor to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,381
Int. Cl.³ D03D *47/34*
U.S. Cl. 139—453 **13 Claims**

1. In a weaving loom having a movable control cord pattern control mechanism for selection of fill yarns to be inserted into the warp yarn sheet of the loom during weaving operations including a reciprocating fill yarn carrier for traversing the warp yarn shed for the loom to insert fill yarns therein, fill yarn selector means positioned adjacent the path of traverse of the carrier and responsive to predetermined electrical signals to selectively present any one of a plurality of fill yarns to the carrier for insertion thereby into the warp yarn shed, fill yarn control cords movable in response to a preselected fill yarn pattern on the pattern control mechanism, and electromechanical indicator means connected to said cords for translating motion of said cords into electrical signals and for sending the signals to said fill yarn selector means to present selected ones of the plurality of fill yarns to the carrier during the weaving operation; the improvement wherein said indicator means comprises:

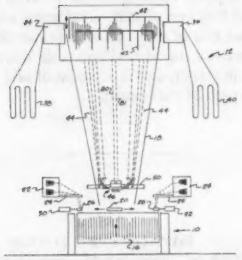
(a) a plurality of slidable elements corresponding in number to one-half the number of fill yarn control cords;

(b) means mounting each of said slidable elements adjacent said control cords for reciprocable sliding movement along a predetermined path of travel;

(c) an electrical contact on each of said slidable elements;

(d) means for supplying an electric current to each of said contacts;

(e) a pair of electrical contacts spaced along the path of travel of each slidable element for selective engagement



by said slidable element contact;

(f) means electrically connecting each contact of said pairs of electrical contacts to said fill yarn selector means to transmit electrical signals thereto when any ones of said pairs is engaged by one of said slidable element contacts and electrical current is supplied thereto; and

(g) a fill yarn control cord attached to each end of each slidable element whereby movement of selected of the control cords in response to fill yarn pattern information the pattern mechanism move the slidable elements to which they are attached so that their contacts selectively engage ones of said pairs of electrical contacts in said their paths of movement to send said electrical pattern signals to said fill yarn selector means.

4,256,150

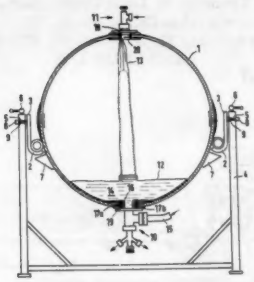
METHOD OF FILLING A PLASTIC BAG IN A PRESSURE TANK WITH A CARBONATED BEVERAGE, IN PARTICULAR BEER

Erich Möckesch, Heilbronn, Fed. Rep. of Germany, assignor to Bier-Drive AG, Switzerland

PCT No. PCT/EP78/00009, § 371 Date Apr. 11, 1979, § 102(e) Date Apr. 4, 1979. PCT Pub. No. WO79/00093. PCT Pub. Date Mar. 8, 1979
This PCT application filed Apr. 4, 1979, Ser. No. 27,652
Int. Cl.³ B65B *3/04, 3/16*
U.S. Cl. 141—5 **2 Claims**

1. A method of filling a plastic bag in a pressure tank with a carbonated beverage, in particular beer, the pressure tank being provided with two opposed openings, one of which is closed by a beverage fitting for filling and tapping, and the other by a compressed-gas fitting for the introduction of compressed gas between the tank wall and the plastic bag, in which method the plastic bag is introduced into the pressure tank in the folded condition through an opening therein before the fittings are mounted, a pressure-resistant flow-through connection then being established between the open end of the plastic bag and the filler fitting as the latter is mounted, and in which method compressed gas is then fed to the compressed-gas fitting, and thereupon beverage is fed to the beverage fitting, characterized by the fact that the plastic bag (12) is introduced

into the pressure tank (1) inside a hoselike jacket (13), said plastic bag (12) being pulled out of said jacket (13) and said



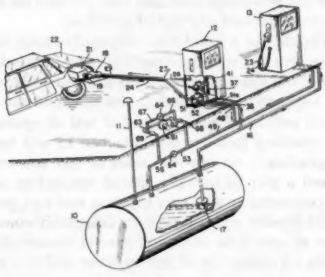
jacket remaining in the pressure tank (1) while the plastic bag (12) is being filled.

4,256,151

SYSTEM FOR DISPENSING A VOLATILE FUEL

Kenneth M. Gunn, Glenham, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,145
Int. Cl.³ B65B *31/04*
U.S. Cl. 141—59 **7 Claims**



1. In a volatile liquid dispensing system which includes; a liquid circuit adapted to pump a stream of a volatile liquid from a reservoir thereof to two or more liquid dispensers, and thence to a receiving tank (21), which system includes;

a vapor circuit to concurrently conduct vapor from said receiving tank (21) to a vapor storage facility,

pump means (17) having an inlet communicated with liquid in said reservoir (10),

a venturi (37) in said liquid circuit being connected with the discharge of said pump (17) to receive a stream of liquid therefrom, said venturi having high pressure and low pressure taps (47 and 42) respectively,

valve means (26) including a valve element (27) communicated with said vapor storage facility and having a pressure sensitive valve operator (31, 34, 36) operably engaged therewith for adjusting said valve between open and closed positions, and connecting means (44 and 46) communicating said venturi (37) with said pressure sensitive valve operator to transmit a pressure differential thereto when the stream of liquid passes through said venturi whereby to open said valve element (27) to a vapor flow,

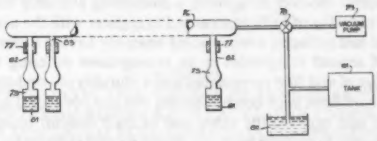
and a liquid bypass means (51, 52, 51*a*) within said vapor circuit positioned to prevent liquid accumulation therein.

4,256,152

APPARATUS FOR PREPARING AMPULLAS

Guy Bélangér, and Gilles Missout, both of St. Bruno, Canada, assignors to Hydro-Quebec, Quebec, Canada

Division of Ser. No. 963,518, Nov. 24, 1978. This application Jul. 5, 1979, Ser. No. 54,795
Claims priority, application Canada, Sep. 18, 1978, 311484
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—70 **3 Claims**



1. An apparatus for preparing ampullas useful in the calibration of a means for detecting and measuring the hydrogen gas content in a liquid substance, said apparatus comprising:

an elongated glass tube having a closed extremity and an open extremity, and provided with a plurality of conduits disposed along a generatrix of said tube;

a plurality of ampullas, each ampulla having approximately half of its volume filled with a liquid identical to said liquid substance and being hermetically connected to said tube conduits;

a vacuum pump means for degasifying the liquid contained in the ampullas;

a reservoir containing a nitrogen-hydrogen mixture in a proportion of about 1 to 3% vol./vol. for saturating, in the liquid in each ampulla, a given quantity of gaseous hydrogen; and

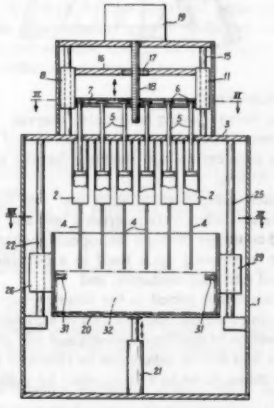
a three way valve means, secured to said open extremity of the tube, for selectively placing said tube in communication with either said pump means or said reservoir.

4,256,153

DEVICE FOR SIMULTANEOUS TRANSFER OF A PLURALITY OF LIQUIDS

Jacques Lamaziere, Paris, France, assignor to Societe Francaise pour le Developpement de l'Automatisme en Biologie, Paris, France

Filed Jul. 9, 1979, Ser. No. 56,009
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—84 **4 Claims**



1. A device for simultaneously transferring a plurality of quantities of liquid in either direction between two receivers

having receptacles for said liquids disposed in different arrangements, said device comprising:

a plurality of vertical syringes having bodies, plunger rods, and needles,

means for actuating all said syringes simultaneously so that each of them draws up or delivers a quantity of liquid through its associated needle,

a first receiver having a plurality of first receptacles arranged to register with the needles of said syringes,

a second receiver comprising a connecting assembly having a plurality of orifices arranged to register with the needles of said syringes, a receptacled assembly having a plurality of second receptacles in an arrangement differing from that of said first receptacles, and a plurality of conduits for liquid flow, each conduit having one end connected to one of said orifices, the other end of each conduit being arranged to register with one of said second receptacles, and means for bringing said second receptacles into register with said conduits,

vertically movable carriage means disposed below said needles and adapted to hold interchangeably a selected one of said first and second receivers, and

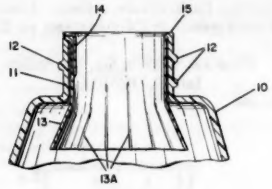
first drive means for moving said selected one of said receivers held by said carriage into register with said needles, whereby said needles register respectively with said first receptacles or with said orifices.

4,256,154

BOTTLE WITH RETRACTABLE FUNNEL TOP

Steven Black, 10041 Jon Day Dr., Huntington Beach, Calif. 92646

Filed Jul. 9, 1979, Ser. No. 56,054
Int. Cl.[3] B65B *39/02*; B65D *1/02*; B67C *11/00*
U.S. Cl. 141—98 **5 Claims**



1. In combination,

container means having an opening therein,

funnel means formed as a unitary portion of said container means adjacent to said opening thereby to form a one-piece device,

said funnel means formed such that said funnel means is flexible and selectively insertable into and removable out of said container through said opening wherein said funnel means is reversed upon itself in a collapsed state when inserted into said container, and

flexible tab means joined to the outer surface of said funnel means intermediate the free end of said funnel means and the junction of said funnel means and said container means so that said funnel means can be removed from said container means to be in a set-up state by pulling on said tab means,

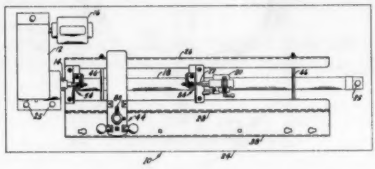
said tab means extending into said container means when said funnel means is stored therein and arranged to conform to the funnel means when stored.

4,256,155

WOOD LATHE WITH DUPLICATING MEANS

Brian R. Hochstatter, Florissant, and George J. Groya, Missouri River Township, St. Louis County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 23, 1979, Ser. No. 41,863
Int. Cl.[3] B23B *3/28*
U.S. Cl. 142—7 **9 Claims**



1. Duplicating equipment for a wood lathe having a head stock and ways mounted on a flat bed and a tail stock slidably adjustable along the ways, including; a pair of elongated members for mounting on said bed along opposite sides of said ways, said members each having a horizontal surface portion extending along a side of and above said ways and said horizontal surface portions being spaced transversely sufficiently to permit passage therebetween of said tail stock, a tool holder comprising an elongated flat base arranged to span said spaced horizontal surface portions and to be freely slidable thereon, an upstanding tool post with a cutting tool mounted therein and positioned near one end of said elongated base and an upstanding follower pin positioned near said tool post and on the side thereof remote from said one end of said base.

6. A tool holder for a wood lathe arranged to slide freely in any direction on a flat horizontal surface positioned below the turning axis of the lathe comprising; an elongated flat base, an upstanding tool post with a cutting tool mounted therein attached to and positioned near one end of said elongated base, a pair of upstanding follower pins attached to said base and spaced longitudinally on opposite sides of and adjacent said tool post, and a pair of laterally spaced upstanding handles detachably connected to said base adjacent said tool post, and means on said handles and said base for detachably connecting said handles to said base in lateral spaced relationship and longitudinally on either side of and adjacent said tool post.

4,256,156

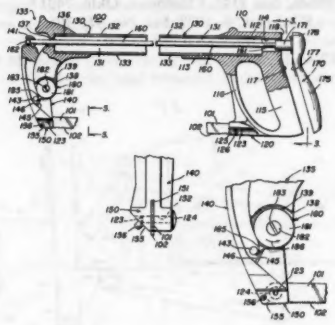
MULTI-TENSION HACKSAW

Donald W. Biszantz, Loveland; Russell H. Landers, Hillsboro; James H. Sexton, Bainbridge, all of Ohio, and Dominic J. Iammarino, St. Joseph, Mich., assignors to Easco Tools, Inc., Glen Burnie, Md.

Filed Jul. 5, 1979, Ser. No. 54,718
Int. Cl.[3] B27B *21/02*
U.S. Cl. 145—33 A **14 Claims**

1. A multi-tension hacksaw for utilizing both bimetal blades and high speed blades comprising a longitudinally extending hollow frame member, a first blade support member extending laterally from said frame member adjacent to one end thereof and fixedly attached thereto, a second blade support member extending laterally from said frame member adjacent to the other end thereof and pivotally attached thereto, a tensioning rod extending through said hollow frame member and having a threaded first end adjacent to said first blade support member and a second end pivotally connected to said second blade support member, and an elongated crank handle adjacent to said first blade support member for reacting thereagainst and

threadedly and rotatably engaging the threaded first end of said tensioning rod to apply a high tension thereto and in turn



to apply a high tension to a bimetal blade mounted between said blade support members.

4,256,157

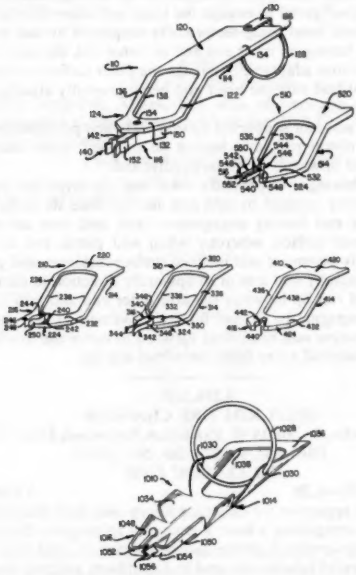
NUT, BOLT, AND SCREW HOLDER

Robert E. Grayson, Rt. 2 S. Box 699, Great Falls, Mont. 59405

Filed Oct. 26, 1979, Ser. No. 88,477

Int. Cl.³ B25C *3/00*

U.S. Cl. 145—46 **17 Claims**



1. A nut, bolt, and screw holder arranged for being mounted on a finger of a user of the holder, the finger having a longitudinal extent, the holder comprising, in combination:

(a) support means for contacting a finger along the longitudinal extent of the finger and being removably retained on the finger; and

(b) holding means mounted on the support means for selectively engaging an item to be held and retaining the item on the support means, the support means including a longitudinally extending member, and finger engaging means provided on the member for cooperatively engaging with an associated finger and removably retaining the member on the finger, the longitudinally extending member including a first end and a second end spaced longitudinally from the first end, the holding means being arranged on the member at the first end, and the finger engaging means including a ring pivotally mounted on the member adjacent to the second end of the member, the ring being arranged for receiving a finger on which the holder is to be mounted.

4,256,158

PNEUMATIC TIRE WITH PUNCTURE-SEALING LINING COMPRISING A VULCANIZABLE LAYER AND A DISPERSED VULCANIZATION COMPONENT

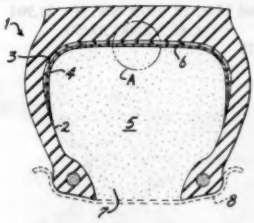
Jean Chautard, Mozac, and Andre Chemizard, Clermont-Ferrand, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermon-Ferrand, France

Filed Jul. 13, 1979, Ser. No. 57,517

Claims priority, application France, Jul. 17, 1978, 78 21346

Int. Cl.³ B60C *21/08, 17/00*

U.S. Cl. 152—330 RF **20 Claims**



1. A pneumatic tire having, between two vulcanized elastomeric partitions, a layer of a vulcanizable sealing mixture which extends at least in part over the inner wall of the tire, characterized by the fact that the layer of vulcanizable sealing mixture has a base of at least one vulcanizable elastomer of low molecular weight less than 30,000, contains at least one component of a vulcanization system for the vulcanizable elastomer and has an apparent viscosity of between 10^3 and 10^7 N/s/m^2 and preferably between 6×10^4 and 10^6 N/s/m^2 at 60° Celsius measured with a Weissenberg rheogoniometer at a shear velocity gradient of 10^{-2} to $10^{+}s^{-1}$; at least one other component which forms the vulcanization system with the component contained in the vulcanizable sealing mixture being contained in a dispersion within the cavity of the tire.

4,256,159

METHOD AND APPARATUS FOR MARKING TIRES

James H. Williams, R.R. #1, Box 513, Shelbyville, Ind. 46176

Filed Sep. 12, 1979, Ser. No. 74,898

Int. Cl.³ B60C *13/00*

U.S. Cl. 152—353 R **14 Claims**

8. A combination of a tire and a tire applique which comprises:

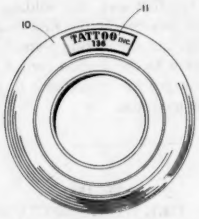
a tire having a surface;

a laminate material secured to the surface of said tire; and

means for securing said laminate material to the surface of said tire;

said laminate material including at least first, second and third layers arranged consecutively, the first layer comprising an elastomeric material adapted for securement to the tire surface, the second layer comprising a stamping material secured to the first layer and including depres-

sions, and the third layer comprising a data material received within the depressions in the second layer,



whereby mounting of said applique to a tire surface provides a marking of the tire with desired data.

4,256,160

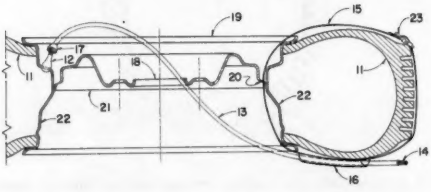
REMOTE AIR PRESSURE MONITORING AND ADJUSTING DEVICE FOR UNDERSLUNG SPARE TIRES

Joseph E. More, 833 Orchard Dr., Redlands, Calif. 92373

Filed Mar. 19, 1979, Ser. No. 21,901

Int. Cl.[3] **B60C** *29/00*

U.S. Cl. 152—427 **1 Claim**



1. Air pressure monitoring and adjusting means adapted for attachment to a pneumatic tire with a standard tire inlet valve mounted on a wheel with a rim and center hub opening and stowed in a spare tire carrier located in a rearward, underslung location on a motor vehicle, to permit checking and adjustment of the air pressure in the tire at a readily accessible location at the rear of said motor vehicle, said air pressure monitoring and adjusting means comprising:

a flexible, tubular air conduit fitted at one end with a standard threaded coupling connectible to said tire inlet valve so as to maintain that valve in an open position to permit the uninterrupted exchange of air between said conduit and said tire;

said conduit being fitted at its other end with a standard threaded one-way air inlet valve substantially the same as the tire inlet valve to permit the exchange of air between said tire and said readily accessible location when actuated by a standard air filling device or air gauge at said location;

said flexible, tubular air conduit being of sufficient length to extend from the air inlet valve of said tire through the center hub opening of said wheel thence rearward to said accessible location;

said air pressure monitoring and adjusting means including securing strap means for said conduit comprising a flexible strap sized to extend around the cross-sectional circumference of the tire and adjacent wheel rim, adjustable fastening means for holding said strap securely therearound and means lonigtudinally integral with said strap to provide a sleeve for receiving and holding said conduit underneath said tire in proper position for rearward extension thereof to said accessible location.

4,256,161

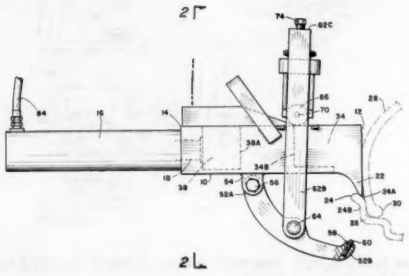
TIRE BEAD DEMOUNTING APPARATUS

Finis L. Chisum, Box 1145, Claremore, Okla. 74017

Filed Nov. 6, 1978, Ser. No. 958,106

Int. Cl.[3] **B60C** *25/06*

U.S. Cl. 157—1.17 **14 Claims**



1. A tool for breaking the circumferential bead of a pneumatic tire from the lip of a wheel rim comprising:

a body having a forward end defining an integral downwardly extending rim engaging tooth;

a cylinder having a piston rod reciprocally extending therefrom, the cylinder being attached to the body at the end opposite the tooth;

a bead head having forward and rearward ends, the forward end configured to engage the bead and sidewall of a tire, the bead head being reciprocally supported by said body;

an arm having an inner end and an outer end, the outer end of the arm adaptable to engage the outer surface of the lip of a wheel rim, the inner end being pivotally attached to said body;

an arm actuator supported by said body and positionable by said piston rod, and having an inclined upper surface sloped upwardly and rearwardly; and

a yoke having an upper and a lower end, the lower end being pivotally secured to said arm intermediate its ends, the upper end having engagement with said arm actuator inclined surface, whereby when said piston rod is forwardly advanced said inclined surface displaces said yoke and thereby said arm in an upwardly direction to clamp a wheel rim lip between the arm outer end and said body rim engaging tooth, and further movement of said piston rod moves said bead head forward to move the tire bead and sidewall away from the wheel rim lip.

4,256,162

SPLIT RIM TIRE CHANGER

Lorant Lacko, Sr., 10619 W. Exposition, Lakewood, Colo. 80226

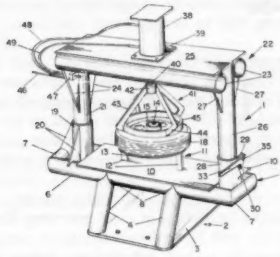
Filed Apr. 9, 1979, Ser. No. 28,215

Int. Cl.[3] **B60C** *25/06*

U.S. Cl. 157—1.28 **3 Claims**

1. In an apparatus for changing heavy duty tires from their split rims comprising a base, a generally rectangular flat base frame plate arranged above and supported on said base by spaced parallel tubular side and end members, pedestal means on said base for horizontally supporting a tire and split rim thereon, cylindrical socket means at one end of said base frame, first vertical cylindrical post means rotatably sleeved within said socket means, generally rectangular flat boom plate means mounted and supported on one end to the upper end of said post means, said boom plate means includes spaced parallel tubular side and end members, a second cylindrical post means at the other end of said boom plate means and depending vertically therefrom, said boom plate means being swingable with said first post means relative to said socket means and base frame, latching means at one end of said base frame including a vertical semi-cylindrical socket coactable with and for receiving the lower end of and for locking said second post

means and said boom plate means in alignment with said base frame when the latter and said boom plate means are swung to active position, fluid cylinder means centrally and vertically arranged on said boom plate means and having piston rod means projecting downwardly of said boom plate means, cage-like ram means carried by said piston rod means including radially spaced downwardly and outwardly angled leg members, a circular rim band mounted on the lower ends of said leg



members and overlying said horizontally mounted tire and split rim means for introducing fluid from a source into said cylinder means to vertically move said ram means and rim band into pressing engagement with and to force the tire from said split rim and permit removal of the latter, said boom plate means being swingable from an active overhead position to an inactive position away from said base frame for mounting and demounting the tire and split rim on the pedestal means thereof.

4,256,163

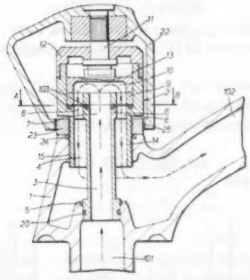
VALVE CARTRIDGE

Willy Orszullok, Altena, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 78,955

Int. Cl.³ F03B *3/00*

U.S. Cl. 137—625.31 **11 Claims**



1. A valve cartridge adapted for mounting to a valve housing having a fluid inflow passage surrounded by a valve seat area and a fluid outflow passage, said valve cartridge comprising:

a cartridge housing including an upper portion adapted to extend above said valve housing and a lower portion adapted to extend into said valve housing, a valve seat disk immovably held in said upper portion and having an inflow aperture in communication with said inflow passage and a plurality of outflow apertures in communication with said outflow passage, a regulating valve disk including a flow channel, said regulating valve disk being positioned in said upper portion in cooperative engagement with said valve seat disk, control means for rotatably moving said regulating valve disk, said regulating valve disk being movable to establish a fluid flow path between said inflow and outflow apertures through said flow channel, said lower portion having an outer cylindrical surface, sealing means disposed between said cylindrical surface and said valve body, means for securing said cylindrical surface to said valve body, said lower portion including an outflow pipe intermediate said outflow aperture and said outflow passage and an inflow pipe intermediate said inflow passage and said inflow aperture, and means for providing a seal between said inflow pipe and said inflow passage.

4,256,164

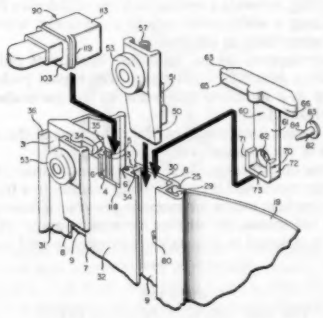
SLIDABLE DOOR STRUCTURE

Clarito R. Agcaoili, Glendale Heights, Ill., assignor to Efron, Incorporated, Chicago, Ill.

Filed Dec. 21, 1978, Ser. No. 971,657

Int. Cl.³ E05D *15/50*

U.S. Cl. 160—186 **21 Claims**



1. A structure for use with a frame which includes top and bottom tracks, said structure being disposed within said tracks and comprising:

at least one mullion having a channel member;

a glide assembly disposed in the top and bottom of said mullion, each of said glide assemblies comprising:

a glide body having a shank and a track engaging means engageable with one of said tracks for moving said mullion along said track, said shank and track engaging means extending outwardly from opposite faces of said glide body;

a retention member which co-acts with said glide body, said retention member including an extension located at one end of said retention member and a glide body stop means located at the remaining end of said retention member;

biasing means disposed between and contacting said glide body and said retention member for biasing said glide body relative to said retention member to permit vertical movement of said glide body relative to said member;

said biasing means being free of contact with said mullion;

said glide body and retention member being disposed within said channel member; and,

means for fastening said retention member to said mullion to permit movement of said glide body relative to said mullion and to permit said mullion and glide assembly to travel along said tracks.

4,256,165
STIRRING OF MOLTEN METAL CORE IN A CASTING AS WITHDRAWN FROM A MACHINE FOR CONTINUOUS CASTING

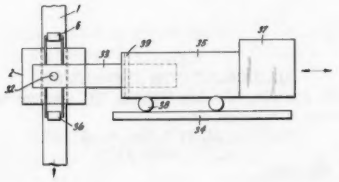
Axel von Starck, Remscheid; Hans E. Gerbig, Hückeswagen-Wiehagen; Hans Schrewe, Duisburg; Jürgen Sardemann, Essen, and Josef Glaser, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf and AEG-Elotherm GmbH, Remscheid, both of, Fed. Rep. of Germany

Filed Jun. 26, 1979, Ser. No. 52,218

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2828160

Int. Cl.³ B22D *27/02, 11/10, 45/00*

U.S. Cl. 164—147 **10 Claims**



1. An electromagnetic stirring device in a machine for continuous casting, wherein a casting in to be withdrawn from the machine along a withdrawal path in a particular withdrawal direction, comprising in combination:

stationary support means, including horizontal rail means extending generally toward the withdrawal path of the casting in a direction transverse to the particular withdrawal direction;

carriage means for running on the rail means of the support means in the said transverse direction; and

at least one electromagnetic stirring element mounted on the carriage means and in overhanging relation to a front part of the carriage means for extending beyond a front portion of the rail means, the stirring element being provided for being positioned in adjustable proximity to said casting.

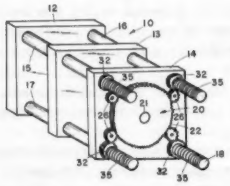
4,256,166
TIE BAR ADJUSTMENT SYSTEM

Edgar D. Prince, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jan. 11, 1979, Ser. No. 2,612

Int. Cl.³ B22D *17/26*

U.S. Cl. 164—154 **16 Claims**



1. In a die casting machine including front and rear end plates, a plurality of tie bars extending between said end plates, a traveling plate slidably positioned on said tie bars for movement between said end plates, each of said tie bars secured to one end plate by externally threaded sleeves positioned over one end of the tie bars, rotatable threaded adjustment nuts coupled to said one end plate and engaging said threaded sleeves for adjustment of said tie bars, centrally positioned adjustment means for rotating said adjustment nuts, the improvement comprising:

means for selectively coupling one or more threaded adjustment nuts with said adjustment means and control means including a control circuit coupled to said selective coupling means for automatically selectively adjusting the tension of said tie bars within prescribed limits.

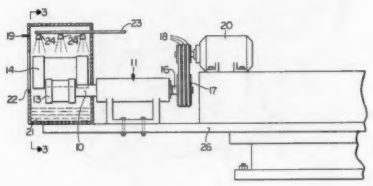
4,256,167
APPARATUS FOR CENTRIFUGAL CASTING

Dwight L. Evans, Jr., 509 Windsor Ter., Anniston, Ala. 36201

Filed Mar. 23, 1979, Ser. No. 23,081

Int. Cl.³ B22D *13/02, 13/04, 13/10*

U.S. Cl. 164—298 **3 Claims**



1. An apparatus for centrifugally casting molten metals and the like comprising:

(a) a pair of side-by-side, substantially horizontal, parallel bearings,

(b) shafts rotatably mounted in said bearings,

(c) means operatively associated with at least one of said shafts at one end thereof to apply power to rotate at least one of said shafts,

(d) said shafts projecting in unsupported, cantilever fashion from said bearings at ends thereof opposite the one end to which power is applied to said one of the same, and

(e) cylindrical collars on the extremities of said unsupported projecting portion of said shafts, said collars being located beneath an axis of rotation of a centrifugal mold mounted on said collars of said unsupported projecting portions of said shafts, said collars forming the sole support for said mold.

4,256,168
COOLING SPRAY NOZZLE ADJUSTING ARRANGEMENT PARTICULARLY FOR STEEL STRAND CASTING PLANTS

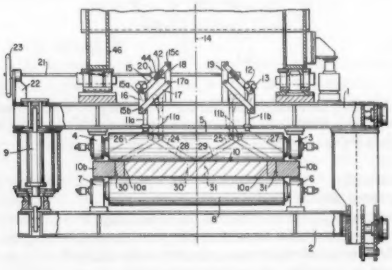
Karl Hein, Duisburg, Dieter Kothe, Moers, both of Fed. Rep. of Germany, assignor to DEMAG, Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 822,532, Aug. 8, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,951

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636666

Int. Cl.³ B22D *11/124*

U.S. Cl. 164—444 **5 Claims**



1. In a metal strand casting plant provided with means to guide the cast strand along a path of travel defined as a strand path and spray nozzles positioned along said strand path for

subjecting the cast strand to secondary spray cooling, an improved spray nozzle apparatus comprising:

(a) a support for traversing the strand path;

(b) a plurality of nozzles associated with said support and arranged for movement in a spray nozzle plane transverse to the strand path;

(c) a separate mount on said support for carrying each spray nozzle;

(d) a separate parallelogram adjusting linkage mounted on each mount and carrying one of said plurality of spray nozzles;

(e) first means on said support for adjusting the distance of said plurality of spray nozzles in said spray nozzle plane in a first direction toward or away from the strand path;

(f) second means on said support for adjusting the spacing between said plurality of spray nozzles in said spray nozzle plane in a second direction perpendicular to said first direction;

(g) said parallelogram linkage superimposing displacement of said spray nozzles in said first and second directions in response to adjustments by said first and second adjustment means, respectively.

4,256,169

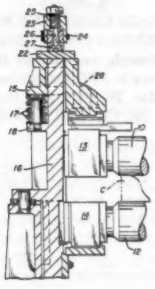
SHEAR PLUG FOR USE IN A CURVED ROLL-RACK

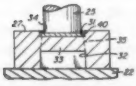
Kenneth D. Ives, Murrysville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 911,647, Jun. 1, 1978, abandoned. This application Aug. 24, 1979, Ser. No. 69,448

Int. Cl.³ B22D *11/128*

U.S. Cl. 164—448 **7 Claims**





1. A shear plug comprising an integral body having a relatively shallow recess in one face, an axially aligned recess in the opposite face, and a wall separating said recesses and being of a thickness no greater than the depth of said second-named recess, and a disk within said shallow recess overlying said wall, said shallow recess being adapted to receive punch means of smaller lateral dimensions than the dimensions of said disk, said wall being adapted to have a segment punched therefrom on failure of the plug, which segment, after being punched from said wall, tapers toward said shallow recess and remains within the confines of said body, the smaller end of said segment having lateral dimensions approximately equal to those of the disk and being greater than the lateral dimensions of the punch means.

6. In a curved roll-rack which includes:

an opposed pair of top and bottom rolls;

a tension strap;

means connected to said tension strap in which said rolls are journaled;

a load cell connected to said tension strap for measuring loads applied to said rolls; and

a shear plug supported in said tension strap and engaged by said load cell and being adapted to fail when overloads are applied to said rolls;

the improvement in which said shear plug comprises:

an integral body having a relatively shallow recess in one face receiving said load cell and an aligned recess in the opposite face; and

a wall separating said recesses and being of a thickness no greater than the depth of said second-named recess;

said load cell having a smaller diameter than said recesses and being adapted to punch out a segment from said wall on application of an overload to said rolls;

which segment after being punched from said wall tapers toward said load cell and remains within the confines of said body.

4,256,170

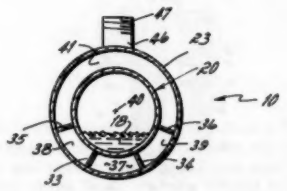
HEAT EXCHANGER

Robert F. Crump, 1503 Thackeray Dr., Louisville, Ky. 40205

Filed Jul. 20, 1979, Ser. No. 59,378

Int. Cl.³ F28D *7/10*

U.S. Cl. 165—1 **8 Claims**



1. A liquid-to-liquid heat exchanger comprising

an inner pipe adapted to be horizontally oriented in a piping system, said inner pipe being sized so that flow of a first liquid therethrough normally does not fill said pipe when said pipe is horizontally disposed,

a first passageway formed in heat exchange relation with said pipe to permit flow of a second fluid therethrough, said first passageway being located generally parallel to the longitudinal axis of said pipe and entirely beneath the normal flow of said first liquid through said pipe, said first passageway directing the flow of said second fluid in one of the same and counter-flow directions relative to the flow direction of said first fluid through said pipe,

at least one second passageway formed in heat exchange relation with said pipe adjacent said first passageway, said first passageway being fluid connected at one end only to said second passageway, said second passageway also extending generally parallel to the longitudinal axis of said pipe, and

said second passageway directing the flow of said second fluid in the other of the same and counter-flow directions relative to the flow path of said first fluid through said pipe, thereby providing heat transfer between first and second fluids of different temperature as the first fluid flows in a generally linear flow path from one end of said pipe to the other and as the second fluid flows in a generally serpentine flow path through said first and second passageways.

7. A method of pre-heating cold water flowing in a cold water supply line by extracting heat from hot waste water flowing in a waste water drain line, said method comprising the steps of

orienting a section of said drain line in a substantially horizontal position,

flowing hot waste water through said horizontal drain line section in a volume less than that required to fill said drain line section, said hot waste water flowing therethrough over no more than about the bottom one-half portion of said drain line,

passing water from a cold water supply in a first pass in heat exchange relation with a longitudinal portion of the bottom surface of said drain line section, said cold water first pass being made in a flow direction counter to the flow direction of said hot waste water, and being made through a passageway entirely beneath the flow of said hot waste water, passing through said drain line section, and

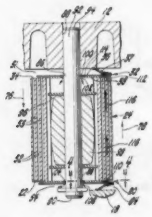
thereafter reversing said cold water flow and passing said cold water in a second pass in heat exchange relation with said same drain line section, said second pass being made in a flow direction the same as the flow direction of said hot waste water.

4,256,171

REGENERATOR SEAL HUB GAS PASSAGES

Richard M. Zeek, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 5, 1979, Ser. No. 9,107
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—7 **2 Claims**



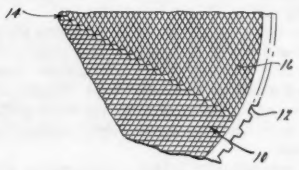
1. A rotary regenerator comprising: housing means defining an air flow path and a gas flow path for air and gas at different pressure levels, an axial flow matrix with a hub including a center opening, said matrix also having open ended passages extending across the flow paths, said matrix having said open end passages pervious to fluid flow through the paths and including inboard and outboard radial surfaces, spindle means for rotatably supporting said matrix for rotation with respect to said housing, an outboard cross arm seal assembly interposed between the housing means and said outboard radial surface and including an outboard cross arm with a platform and wear surface extending between said flow paths for sealing therebetween, an inboard cross arm seal assembly including an inboard cross arm having a seal platform and a wear surface engageable with said inboard radial surface to seal between the flow paths at the inboard radial surface of the matrix, means including aligned bores in said outboard and inboard seal assemblies for defining an air circulation path for distribution of cold air from the air path to the outboard seal assembly through the center opening in said matrix and for distributing cold air through the matrix and in surrounding relationship to said spindle means, a center hub wear surface region of said inboard cross arm cooled by cooling air flow through one of said aligned bores, and heater means for reheating said center hub wear surface region to counteract the cooling effect of cooling air flow on said center hub wear surface region of said inboard seal assembly thereby to maintain a uniformly elevated temperature across the full planar extent of the inboard cross arm wear surface to optimize the operating temperature thereof during gas turbine engine operation so as to maintain low friction and wear characteristics between said last mentioned seal wear surface and the matrix.

4,256,172

HEAT EXCHANGER MATRIX CONFIGURATION WITH HIGH THERMAL SHOCK RESISTANCE

Christian J. Rahnke, Orchard Lake, and Jeffrey A. Cook, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 14, 1979, Ser. No. 48,405
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—8 **2 Claims**



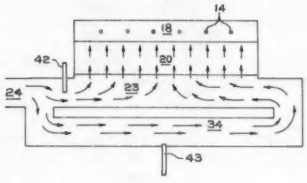
1. A heat exchanger adapted to accommodate a flow of gases therethrough comprising a ceramic matrix having a plurality of contiguous cells that define parallel flow passages extending through the matrix in the direction of the central axis thereof, each cell having four side walls that define a parallelogram having a major diagonal and a minor diagonal, the major diagonal of each cell extending generally in the direction of a tangent to the outer periphery of said matrix at the angular position of that cell.

4,256,173

TWO REGENERATOR-FLUE SYSTEM FOR REGENERATIVE FURNACES

Yih-Wan Tsai, Pittsburgh, and Robert H. Duffus, Kitanning, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1979, Ser. No. 25,140
Int. Cl.³ F28D *17/04*
U.S. Cl. 165—9.3 **4 Claims**



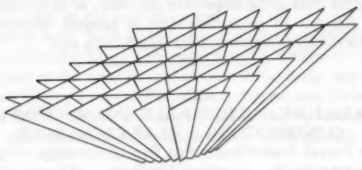
1. In a regenerative furnace of the type comprising a combustion chamber, a pair of regnerator chambers, a plurality of burner ports spaced along elongated rows on opposite sides of the combustion chamber providing for the alternate passage of air and exhaust gases between the combustion chamber and the regenerator chambers, and fuel feeding means associated with each burner port, and in which each regenerator chamber includes a gas-pervious bed of refractory material extending along one side of one of said rows of burner ports, a plenum communicating with one side of said bed along its length and with one of said rows of burner ports, a gas distributing space communicating with the opposite side of said bed along its length, and a flue communicating with said gas distributing space at one end thereof, the improvement comprising: a by-pass passage communicating with said flue adjacent to the junction of the flue with said one end of the gas distributing space, and communicating with the opposite end of said gas distributing space from said end in communication with said flue.

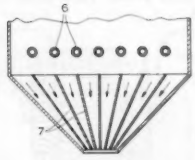
4,256,174

APPARATUS FOR HEATING AND COOLING SAND

Etuji Yoshida, Wakayama, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 692,192, Jun. 2, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 896,793
Claims priority, application Japan, Jun. 2, 1975, 50-74587
Int. Cl.[3] F28F 3/14
U.S. Cl. 165—DIG. 27 6 Claims





1. An apparatus, especially for heating or cooling sand, of the kind including:

a vertically elongated container having a downwardly tapered bottom wall defining a convergent discharge funnel having a downwardly opening outlet at its lower end for discharging the contents of said container;

heat exchange means disposed in said container above the wide upper end of said discharge funnel for heat exchange contact with the contents of the container substantially across the cross-section of the container; and wherein the improvement comprises

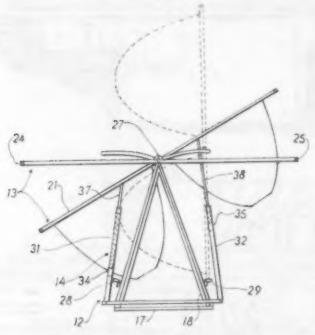
a flow-regulating assembly positioned in said convergent discharge funnel below said heat exchange means for causing the contents of said container to move downwardly over the entire cross-section of the container for effective heat exchange over the entire area of the heat exchange means, said flow-regulating assembly extending from adjacent the wide upper end of said discharge funnel to adjacent the narrow lower end thereof, said flow-regulating assembly filling substantially the entire cross-section of said convergent discharge funnel and having wall means dividing said convergent discharge funnel into a multitude of inverted elongated frusto-pyramidal or frusto-conical passages arranged side-by-side contiguous relation across the entire cross-section of said discharge funnel, the wide upper ends of said passages opening upwardly and respectively communicating with laterally adjacent portions of said container substantially at or above the upper end of said discharge funnel so that the contents of said container across substantially the entire cross-sectional area of the container above said discharge funnel can be received in the respective passages, the longitudinal central axes of said passages being inclined with respect to the vertical and converging with respect to each other in a direction toward said narrow funnel outlet, such that said frusto-conical or frusto-pyramidal shapes of said passages progressively further from the longitudinal central axis of said discharge funnel are progressively more skewed, the narrow lower ends of said passages being located close to, substantially vertically directly above and opening to said narrow funnel outlet so that the contents of said container flow by gravity to said narrow funnel outlet through each of said passages.

4,256,175

SOLAR FURNACE SUPPORT APPARATUS

Benjamin W. Strickland, Box 30, Joliet, Mont. 59041

Filed Aug. 7, 1979, Ser. No. 64,482
Int. Cl.[3] F28F 9/00
U.S. Cl. 165—67 9 Claims



1. A solar furnace support apparatus including frame means, furnace holding means and actuating means, said frame means including a base portion and an upstanding portion; said furnace holding means being pivotally carried by said frame means, said furnace holding means including spaced longitudinal members, cross members connecting said longitudinal members adjacent the ends thereof, shaft means disposed adjacent the center of said longitudinal members and disposed adjacent the connection of said cross members with said longitudinal members, said shaft means being engageable with releasable locking means disposed on said frame means adjacent the top of said upstanding portion and adjacent the base portion thereof, actuating means for moving said furnace holding means, said actuating means including cooperating means operatively connected to at least one of said longitudinal members at points along the length thereof substantially equidistant from the center.

4,256,176

HEAT-RECLAIMING SYSTEM

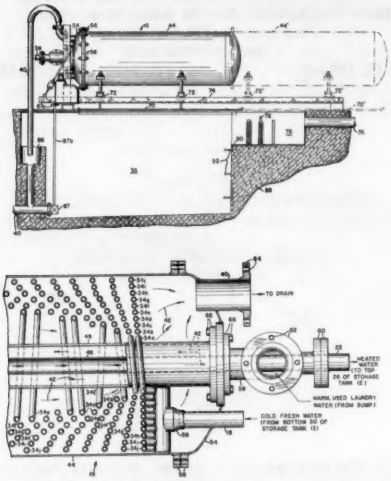
Kenneth W. Cohen, Plainfield, N.J., assignor to Aerco International, Inc., Northvale, N.J.

Filed Apr. 10, 1978, Ser. No. 894,835
Int. Cl.[3] F28F 7/00
U.S. Cl. 165—76 11 Claims

1. In a heat exchanger comprising duct means in the form of a plurality of coils and shell means, said duct means providing a first space for the transport through said heat exchanger of a first fluid at one temperature, said shell means enclosing said duct means during operation of said heat exchanger, and said duct means and said shell means together providing a second space during operation of said heat exchanger for the transport through said heat exchanger of a second fluid at a different temperature, said two spaces being isolated from each other to prevent commingling of said fluids in said heat exchanger, further comprising inlet means for admitting a relatively cool fluid to said heat exchanger, inlet means for admitting a relatively warm fluid to said heat exchanger, outlet means for

withdrawing said relatively cool fluid after heating, and outlet means for withdrawing said relatively warm fluid after cooling, a connection means being provided for connecting one of said inlet means and its corresponding outlet means to said first space and the other of said inlet and outlet means to said second space, the improvement characterized in that:

said shell means is in the form of a stationary section and a movable section, both of said inlet means and both of said outlet means penetrating only said, stationary section, said duct means being mounted within said shell means on said stationary section in cantilever fashion;


TO DRAIN
HEATED WATER TO TOP OF STORAGE TANK (2)
WARM USED LAUNDRY WATER (FROM SUMP)
COLD FRESH WATER FROM BOTTOM OF STORAGE TANK (2)

said shell means is openable for exposure of said coils and cleaning of the interior of said heat exchanger solely by moving said movable section away from said stationary section without disturbing any of said inlet and outlet means or said connection means; and

said coils are concentric and staggered so that each coil is partly exposed along its longitudinal extent to permit cleaning thereof solely by removal of said movable shell section from said stationary shell section.

4,256,177

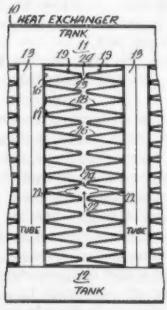
HEAT EXCHANGER

Zalman P. Saperstein, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Nov. 9, 1978, Ser. No. 959,350

Int. Cl.³ F28D *1/04*

U.S. Cl. 165—151 **6 Claims**



1. A heat exchanger, comprising: a plurality of spaced tubes; means for directing a first heat exchange fluid through said tubes, an adjacent pair of said tubes having spaced confronting surfaces; a plurality of heat exchange fins in spaced sets attached to said confronting surfaces of said tubes, said sets of fins having portions adjacent to but spaced from each other to permit flow of a heat exchange second fluid over said fins and between said spaced portions for substantially unrestricted flow of said second fluid and said fins being essentially serpentine in cross section with the fins of the two sets each having a plurality of linearly successive apexes adjacent to but spaced from corresponding apexes of the other set to provide for said second fluid circulation; and a metallurgical bond integrally joining said fins to the respective said tubes so as to make each set of fins and its respective tube an integral, efficient, and metallurgically continuous heat transferring unit.

4,256,178

COAXIAL HEAT EXCHANGER AND METHOD FOR CONSTRUCTING A HEAT EXCHANGER

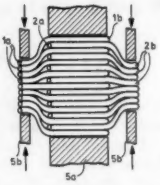
Günter Fauvel, Unterföhring, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,781

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706715

Int. Cl.³ F28F *21/04*; F28D *7/00*; F28F *9/04*

U.S. Cl. 165—165 **24 Claims**



1. A heat exchanger which includes a plurality of juxtaposed parallel tubes for the purpose of effecting a heat exchanger when the tubes are traversed by two fluid media between which the heat exchange is to be effected, each tube having a tube end for an entrance of a respective fluid medium and a tube end for an exit of a respective fluid medium, characterized in that at each end of the heat exchanger the tube ends of the tubes to be traversed by one of the fluid media project in an axial direction beyond the tube ends of the other remaining tubes at that end of the heat exchanger and are combined into a bundle in the manner of a bottleneck wherein the tube ends of the bundle contact one another.

4,256,179

INDEXING TOOL FOR USE IN EARTH BOREHOLE DRILLING AND TESTING

Harold E. Shillander, Albuquerque, N. Mex., assignor to International Oil Tools, Inc., Seattle, Wash.

Filed Oct. 15, 1979, Ser. No. 84,679

Int. Cl.³ E21B *23/00*; F16H *27/02*

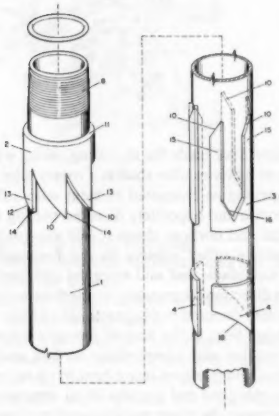
U.S. Cl. 166—237 **2 Claims**

1. An indexing tool for use in well strings in earth borehole drilling and testing wherein the indexing tool comprises:

a mandrel having an upper end and a lower end; and said mandrel having an indexing sleeve rigidly affixed on the outer surface of the mandrel adjacent to the upper end; said indexing sleeve having a plurality of approximately thirty degree cam teeth pointing downward; and said mandrel having a plurality of indexing splines rigidly affixed on the outer surface of the mandrel at approximately the mid-length of the mandrel; said indexing splines being generally U shaped having two cam fingers

and an inner bottom; each of the said cam fingers having approximately thirty degree cam surfaces in same direction; each of the said inner bottom of the indexing splines being V shaped by the intersecting to two approximately thirty degree cam surfaces; the said cam fingers pointing toward the indexing sleeve; and the same mandrel having rigidly affixed on its surface adjacement to the lower end a plurality of seats, said seats being rectangular trapeqoidal in shape and the seats being axially aligned with the indexing splines; the lower end of the lowest set of said seats each having approximately a thirty degree cam surface and the indexing splines being axially aligned with the points on the cam teeth; and

a tubular body sized to slideably accept the mandrel, said tubular body having a plurality of lands and blocks rigidly affixed to the inner surface of the tubular body; said lands each having an approximate thirty degree cam surface on the upper end and a V shaped end formed by intersection of approximately thirty degree cam surfaces, said lands



being sized and shaped to slideably mate with the inside of the indexing splines; and the blocks being sized and shaped to slideably mate on the seats; and the blocks are axially aligned with the lands;

wherein the seats and indexing splines are evenly spaced around the mandrel thereby providing a passage between adjacent indexing splines and between adjacent seats, and the lands and blocks are evenly spaced around the inner surface of the tubular body, and the number blocks, seats, indexing splines, and lands are all the same, the number of cam teeth is twice the number of indexing splines; and wherein the lands and seats can slideably pass through the passage; and when the lands and blocks have fully passed between the indexing splines, the mandrel may fully rotate with respect to the tubular body, and permit actuation of other attendant equipment;

and wherein the tubular body and mandrel are provided with threads, seals and grooves to adapt and mate with other parts currently used in well-strings, such that the indexing tool may be used in tension or compression.

4,256,180

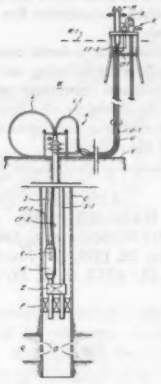
METHOD OF MOVING A THROUGH-THE-FLOWLINE INSTALLED SAFETY VALVE THROUGH A CURVED FLOW LINE

James D. Mott, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 580,228, May 23, 1975, Pat. No. 4,019,574. This application Jun. 7, 1976, Ser. No. 693,324

Int. Cl.³ E21B *23/08, 34/04, 34/10, 42/12*

U.S. Cl. 166—315 **9 Claims**



1. A method of moving a through-the-flowline installed safety valve having a tubular operator through a curved flow line loop of a well head assembly including the steps of:

controlling the fluid pressure in the curved flow line loop for moving the safety valve through the curved flow line loop; and

flexing the tubular operator of the safety valve to enable passage of the safety valve through the curved flow line loop.

4,256,181

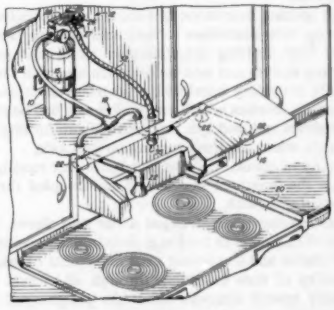
AUTOMATIC STOVE TOP FIRE EXTINGUISHER

Charles C. Searcy, P.O. Box 23, Wauchula, Fla. 33873

Filed Aug. 25, 1978, Ser. No. 936,859

Int. Cl.³ A62C *13/24*

U.S. Cl. 169—65 **5 Claims**

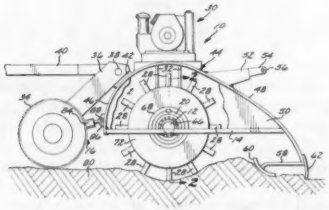


1. A fire extinguishing system automatically actuated in response to flames from a fire on the upper surface of a stove having a vent hood, comprising:

a. a pressurized fire extinguisher having a lever actuated valve biased to the closed position, said extinguisher including a supply of fire extinguishing material;

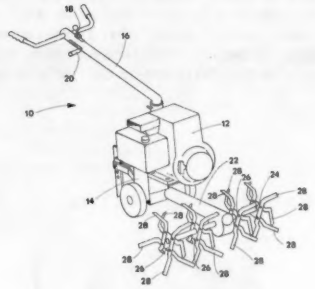
b. a discharge manifold coupled to the valve of said fire extinguisher and having a nozzle positioned within the vent hood for distributing the fire extinguishing material from the extinguisher over the upper surface of the stove when said valve is in the open position;
c. a fusible link coupled to said valve for maintaining said valve in the closed position;
d. means coupled to said valve for biasing said valve to the open position;
e. a fuse coupled to said fusible link and extending through the vent hood into an area above the upper surface of the stove for controllably transferring fire from the vent hood to said fusible link; and
f. a container of flammable material coupled to said fusible link and to said fuse for severing said fusible link when ignited by said fuse and permitting said biasing means to open said valve to discharge the contents of said extinguisher through said manifold into the area above the upper surface of the stove.

4,256,182
HAMMER PLOW
Dell W. Nething, 25512 Narbonne Ave., Lomita, Calif. 90717
Filed May 25, 1979, Ser. No. 42,606
Int. Cl.³ A01B *33/02, 33/10*
U.S. Cl. 172—45 **9 Claims**



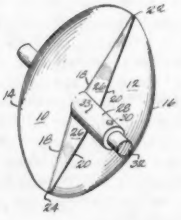
1. A hammer plow comprising:
an axle held transversely above a surface for longitudinal movement perpendicular to its axial orientation,
a sleeve coaxially mounted about said axle for rotation thereabout,
a plurality of bearing race assemblies longitudinally positioned along the length of said axle to carry said sleeve for rotation thereabout and provided in sufficient number to prevent said sleeve from deflecting and oscillating about said axle,
annular spacing sleeves located about said axle between said bearing race assemblies to keep said bearing race assemblies from drifting longitudinally along said axle, said spacing sleeves and said bearing race assemblies including axially extending interlocking protruberances and corresponding recesses which immobilize said ball bearing race assemblies and said spacing sleeves from turning relative to each other and from turning on said axle,
a plurality of annular disks of equal diameter equally spaced along the length of said sleeve and coupled thereto for rotation therewith,
annular spacing rings arranged about said sleeve between each of said disks to hold said disks in fixed position along said sleeve and to prevent axial movement of said disks,
a plurality of rods extending through all of said disks at equally spaced intervals about the periphery thereof in disposition parallel to said axle,
a plurality of hammers mounted upon alternate ones of said rods between adjacent disks, said hammers being short enough to rotate in complete circular paths about said rods without interfering with any of said rods, without interfering with other hammers and without interfering with said spacing rings and said sleeve, said hammers being mounted on each rod only between alternate ones of said disks, and
means for driving said sleeve in rotation about said axle at a speed exceeding 1800 revolutions per minute so that said hammers strike a surface to be plowed at a high speed.

4,256,183
DUAL END ROTARY TILLER BLADE
Martin G. Hanley, 2404 Centerline Industrial Dr., Maryland Heights, Mo. 63043
Filed Mar. 8, 1979, Ser. No. 18,723
Int. Cl.³ A01B *33/10, 33/02*
U.S. Cl. 172—42 **5 Claims**



1. A rotary tiller blade for mounting, along with other similar blades, on a driven tiller shaft in a rotary tiller machine, said blade comprising an elongated element with a flattened intermediate section and oppositely directed cutting teeth adjacent the marginal end portions thereof, said marginal end portions being angularly offset relative to the flattened intermediate section of said blade, and said marginal end portions also bent in opposite directions from said intermediate section to provide said oppositely directed cutting teeth, one of said marginal end portions being bent in the area of juncture between the marginal end portion and intermediate section, and the other of said marginal end portions being bent in an opposite direction to said one marginal end portion in an area spaced from the juncture between the other marginal end portion and intermediate section and at an angle thereto.

4,256,184
REVERSE-DISH TILLER BLADES
John W. Squibb, R.R. 1, Box 755, Bois D'Arl, Mo. 65612
Filed Feb. 14, 1979, Ser. No. 12,131
Int. Cl.³ A01B *15/16*
U.S. Cl. 172—531 **12 Claims**



5. A blade for a rotary disk tiller having a shaft, said blade comprising:
first and second concavo-convex members each having a

curved edge and a straight edge, said straight edge intersecting said curved edge at two points;

said first and second members being directly joined only by the connection of each of said first member two points to one of said second member two points, respectively, said first member concave surface facing in an opposite direction from said second member concave surface;

a member interconnecting said first member straight edge and said second member straight edge, said interconnecting member lying in a plane; and

means for mounting said members to said shaft, said mounting means connected to said members equidistant between said two points, the longitudinal axis of said mounting means lying in said plane and forming an angle of less than 90° with a line interconnecting said two points.

4,256,185

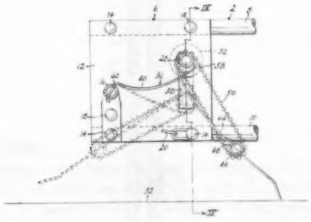
MULCH LOOSENING RAKE

Lawrence L. Duckworth, 7510 Maple La., Raytown, MO 64138

Filed Oct. 29, 1979, Ser. No. 88,769

Int. Cl.³ A01B *31/00*

U.S. Cl. 172—621 **5 Claims**



1. A mulch loosening rake comprising:

a. a frame having a substantial horizontal area and adapted to be drawn over the ground,

b. a large number of slender elongated resilient teeth distributed over the area of said frame,

c. mounting means securing the upper ends of said teeth in said frame, said teeth extending below the lower plane of said frame to engage the ground at their lower ends to support said frame above ground level, the weight of said frame being sufficiently great that when said frame is moved forwardly, the resistance to forward travel of the lower ends of said teeth over the ground will cause said teeth to be flexed upwardly and rearwardly relative to the points of attachment of their upper ends in said frame, each of said teeth having a substantial portion of its length disposed between its point of attachment in said frame and the lower plane of said frame, and

d. a stop member carried by each of said teeth intermediate its ends and operable to be moved upwardly into abutting relation with said frame by said upward and rearward flexing of said tooth, whereby the effective length of said tooth is then limited to that portion thereof between said stop member and the free lower end thereof.

4,256,186

ROOF DRILLING AND BOLTING APPARATUS

Henry P. Barthe, Pittsburgh, and William R. Cobb, Murrysville, both of Pa., assignors to Schroeder Brothers Corporation, McKees Rocks, Pa.

Filed Apr. 16, 1979, Ser. No. 30,220

Int. Cl.³ E21C *11/02;* **E21D** *19/00, 20/00*

U.S. Cl. 173—23 6 Claims

1. An operator cab and drilling assembly for a roof drilling and bolting device including a mobile chassis comprising

a cab having a front and a rear, said cab including a floor and a canopy spaced over the floor, said cab rear being arranged for fixing to said mobile chassis,

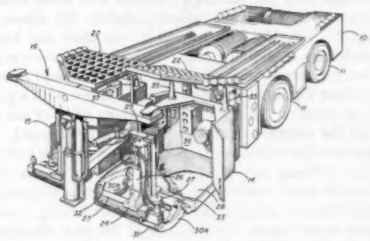
a horizontal rail extending the entire length along the front edge of the floor of the cab and spaced therefrom,

a swinging mount for said rail comprising

two first arms extending forward from the cab, each journaled to opposite outer front edges of the floor,

means journaled between the forward ends of the first arms,

said journaled means comprising said rail as a portion thereof,



a second arm pivotally mounted to said journaled means at one end and at the other end pivotally mounted to the cab such that lines through the pivot points of one of said first arms and the pivot points of said second arm define a parallelogram,

a carriage slidably engaging the rail for transverse movement,

an upright tower mounted to said carriage and spaced between the floor and rail,

a drill pod slidably mounted on said upright tower for vertical movement,

whereby the operator while under the canopy has easy access to the drill pod.

4,256,187

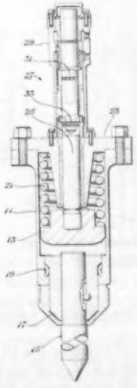
IMPACT TOOL WITH HYDRAULIC COCKING MECHANISM

Louis H. Barnard, Pasadena, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Nov. 30, 1978, Ser. No. 965,202

Int. Cl.³ B25D *9/08, 9/18;* **F01L** *17/00*

U.S. Cl. 173—119 **16 Claims**



1. In an impact tool of the type having a hammer, a working tool, and energy storage means adapted when compressed to

accelerate the hammer to deliver a blow to the working tool whe the hammer is released, an improved hydraulic cocking means for compressing the energy storage means and releasing the hammer, comprising:

a housing having bias and compression chambers;

a shaft connected to the hammer, extending into the compression chamber, and being urged downward by the energy storage means;

an annular stop rigidly connected to the shaft, located in the compression chamber and having a pressure area acted against by pressure in the compression chamber;

a compression sleeve in the compression chamber above the annular stop and having a pressure area acted against by pressure in the compression chamber, the sleeve being axially movable with respect to the shaft and having a periphery in sliding contact with the compression chamber, the compression sleeve having a lower seat adapted to contact the annular stop to define a piston with a pressure area equal to the sum of the pressure areas of the sleeve and the annular stop for urging the shaft upward;

a bias member extending from the sleeve into the bias chamber and being acted on by pressure in the bias chamber to bias the sleeve into contact with the annular stop while the shaft moves upward, the bias member having a pressure area acted against by pressure in the bias chamber, the pressure area of the bias member being less than the pressure area of the piston, but more than the pressure area of the sleeve; and

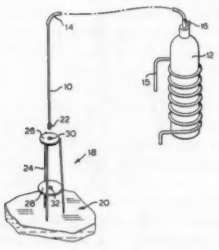
means for supplying substantially the same hydraulic fluid pressure to the bias chamber and to the compression chamber below the piston and providing a substantially lower hydraulic fluid pressure above the piston to move the shaft upward, then at the top of the stroke for reducing the difference between the pressures above and below the piston and for separating the sleeve from the annular stop to allow the shaft to be moved downward by the energy storage means for impact with the hammer, and for reseating the sleeve on the annular stop after impact for recocking.

4,256,188

METHOD AND APPARATUS FOR DRILLING A HOLE IN A BODY OF ICE AND FOR THE DESTRUCTION OF A BODY OF ICE

Robert M. Hopkins, and Roger C. Parsons, both of St. John's, Canada, assignors to Resource Development Consultants Ltd., St. John's, Canada

Filed Jul. 17, 1978, Ser. No. 924,988
Int. Cl.³ F25C *5/04*
U.S. Cl. 175—18 **26 Claims**



1. A method of destroying a body of ice comprising the steps of:

(a) providing a source of reactant gas of a type which will react isothermally with ice causing the formation of unstable compounds which immediately revert to water and dissolved gas, but will not react until it makes contact with ice or water,

(b) directing said reactant gas through a nozzle to generate a stream of reactant gas,

(c) locating said nozzle in close proximity to a body of ice,

(d) directing said stream of gas against a localized area of the surface of said body of ice at a velocity and flow rate to obtain an optimum phase change reaction with the ice and advancing the nozzle towards the body of ice to continue to direct the stream of reactant gas against the receding surface of the body of ice as the ice changes phase.

4,256,189

WELL DRILLING TOOL

Fred K. Fox, and Martin L. Tomek, both of Houston, Tex., assignors to Engineering Enterprises, Inc., Houston, Tex.

Filed May 18, 1979, Ser. No. 40,328
Int. Cl.³ E21B *4/02*
U.S. Cl. 175—40 **9 Claims**

1. A well drilling tool, comprising an elongated body connectible as part of a drill string having a drill bit at its lower end, said body having relatively rotatable, inner and outer tubular members forming a passageway through which drilling fluid may be circulated and an annular space between the members, bearings within the annular space to support one member from the other, means sealing between the members within said space above and below the bearings to form a lubricant chamber in which said bearings are contained, an annular reservoir formed within the inner member concentrically of the lubricant chamber, one end of the reservoir connecting with the passageway through the inner member, and the other end thereof connecting within the chamber, and a piston sealably slidable within the reservoir, in response to pressure of the drilling fluid which enters the reservoir, to force lubricant out of the reservoir and into the chamber in order to replace lubricant which is lost therefrom.

4,256,190

SONICALLY ASSISTED LUBRICATION OF JOURNAL BEARINGS

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Apr. 6, 1979, Ser. No. 27,934
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—56 **4 Claims**

1. A sonic drill for drilling through a material forming a load for the drill including in combination

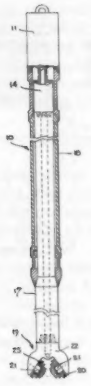
an elastic drilling column,

an orbiting mass oscillator coupled to said column,

means for rotatably driving said oscillator at a frequency

such as to cause resonant longitudinal vibration of said column,

a drilling bit attached to the bottom of said column and receiving the output of said resonant column, said bit including a cutter member and a bearing pin member on which said cutter is rotatably supported, a journal bearing being formed between said members, said pin member extending at an angle which is normal to the longitudinal axis of said column, and



a fluid lubricant,

there being a gap between said members at said bearing in which said lubricant is retained, such that the longitudinal vibration causes the lower portions of said gap to increase while the upper portions of the gap decrease with the upward sonic acceleration of the vibration cycle of the column causing the lubricant to build up in the lower gap portion so that it is available at this location during the downward portion of the sonic cycle.

4,256,191

INTERMITTENT HIGH-DRAG OIL WELL DRILLING METHODS AND APPARATUS

Kenneth W. Jones, Kingwood, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Mar. 28, 1979, Ser. No. 24,842

Int. Cl.³ E21B *3/12, 9/36*

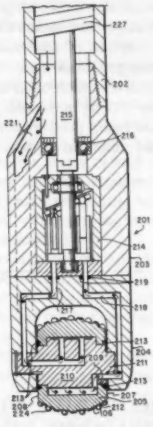
U.S. Cl. 175—93 **9 Claims**

6. A downhole oilwell drilling bit comprising:

a cylindrical tubular housing assembly having an upper threaded end;

a rotatable motor-driven cutting assembly having a cutter wheel with inserted hard metal cutting elements protruding therefrom, and a motor drive system mounting said cutter wheel on a motor shaft;

a power generator in said tubular housing having input transmission means adapted for operable drive connection with a drilling motor in a drilling string, said power generator also having power output means operably connected to said motor drive system; and,



a cooling system in said housing assembly arranged to receive cooling fluid from a drill string and communicate it to said cutter wheel.

4,256,192

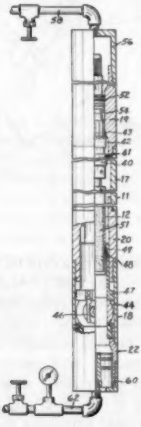
PRESSURE CORE BARREL

James T. Aumann, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jul. 6, 1979, Ser. No. 55,471

Int. Cl.³ E21B *25/00*

U.S. Cl. 175—233 **8 Claims**



1. In a pressure core barrel assembly of the type having an inner barrel adapted to be connected to the lower end of a drilling string and including a core tube; an outer barrel slidably mounted around said inner barrel; a slip joing assembly for lockingly interconnecting said inner and outer barrels in a core cutting condition; means for tripping said slip joint assembly thereby permitting relative axial movement of said barrels to a core-retaining condition, the barrels in core-retaining condition defining an enclosed pressure chamber, said core tube being disposed in the pressure chamber with the barrels in said core retaining condition; a pneumatic control system carried

by said inner barrel for maintaining a controlled pressure in said pressure chamber and a valve operated by said axial movement of said barrels for sealing the bottom of said outer barrel to form the bottom of the enclosed pressure chamber, the improvement which comprises means for providing full mud pump pressure to a portion of said outer barrel at a region thereof having an enlarged cross-sectional area, the inner and outer barrels being sealed to each other against full mud pump pressure at a region having a smaller cross-sectional area whereby said full mud pump pressure creates a force differential which moves said outer barrel downwardly to the core-retaining position.

4,256,193

ROTARY DRILL BIT WITH ROTARY CUTTER

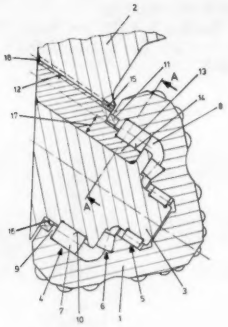
Heinrich Kunkel; Armin Olschewski, both of Schweinfurt; Manfred Brandenstein, Aschfeld, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to Sandvik Ab, Fack & Aktiebolaget SKF, Goteborg, Sweden

Filed May 29, 1979, Ser. No. 42,924

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823698

Int. Cl.³ E21B *10/22*

U.S. Cl. 175—371 **7 Claims**



1. In a rotary drill bit having a drill bit body and at least one trunnion projecting from the drill bit body and a rotary cutter supported on at least one radial roller bearing on the trunnion, means defining a groove in the trunnion defining an inner raceway for the roller bearing bounded by radially projecting circumferentially extending wall portions which confront opposite axial ends of the rollers, means defining an outer raceway in the interior of the cutter and a continuous circumferentially extending flange extending radially inwardly from one end of the outer raceway, said flange confronting the axial end of the rollers remote from the tip of the rotary cutter, means defining at least one filling opening extending essentially axially through the drill bit body and trunnion having its inner terminal end underlying the inner raceway groove in the trunnion, said filling opening being of a diameter larger than the diameter of the rollers so that the rollers may be freely inserted therein and the distance between the inner edge of the flange and the filling opening being slightly larger than the diameter of the rollers to facilitate passage of the rollers past the flange, and at least one filler piece for sealing the opening.

4,256,194

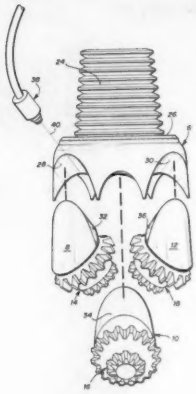
ROTARY DRILL BIT HAVING A SOLID FORGED, UNITARY BODY

Daniel W. Varel, Dallas, Tex., assignor to Varel Manufacturing Company, Dallas, Tex.

Filed May 19, 1978, Ser. No. 907,485

Int. Cl.³ E21B *10/50*

U.S. Cl. 175—375 **17 Claims**



1. A rotary earth boring bit for use on a rotating drill string comprising:

a unitary drill bit body having a plurality of downwardly facing, substantially hemi-cylindrical, inclined body surfaces;

means for attaching an upper portion of said body to the rotating drill string for rotating said body;

a plurality of cutter bases, each having a generally upwardly facing base surface substantially mating with and attached to one of said hemi-cylindrical body surfaces;

each cutter base including an annular shoulder extending outwardly from the end of the cutter base adjacent a means for supporting a cutter;

an annular recess formed in each of the body surfaces and positioned to receive the shoulder of a cutter base; and

a cutter mounted on each of said cutter bases for drilling in earth formations.

4,256,195

WRITING AND WEIGHING INSTRUMENTS

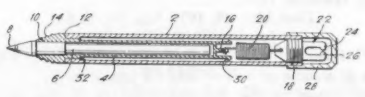
Thomas Bovet, Hong Kong, Hong Kong, assignor to Uptrend Products Ltd., Hong Kong

Filed Mar. 22, 1979, Ser. No. 22,568

Claims priority, application United Kingdom, Apr. 6, 1978, 13566/78

Int. Cl.³ G01G *3/02*; B43K *29/00*

U.S. Cl. 177—232 **3 Claims**



1. A writing and weighing instrument comprising:

an outer tubular body having first and second ends which are open, said body having an inwardly directed flange at said first open end;

an inner member having an enlarged outer end portion disposed external of said body and configured for abutment with said first end of said body, an intermediate

sleeve adjacent said outer end portion in a push-fit relationship within said body at said first end thereof; a narrower sleeve adjacent to said intermediate sleeve slidable axially within said tubular body and said flange, and outwardly projecting abutment means at the outer end of said narrower sleeve adapted for engagement with said flange to prevent complete withdrawal of said inner member from said outer tubular body;

a writing instrument housed within said inner member, said instrument having a tip projecting outwardly from said outer end portion, whereby said instrument can be used for writing when said intermediate sleeve is engaged within said first end of said body;

a plug fitting within and closing said second end of said tubular body, means being provided for adjustably securing said plug within said second end so that the axial extent of insertion of said plug within said other end can be adjusted;

holding means adapted to receive and grip a letter and carried by said plug;

a tension spring positioned within said tubular body and connected between said plug and the outer end of said narrower sleeve of said inner member, said outer tubular body, said inner member and said plug being made from synthetic plastics material;

a scale provided on said narrow sleeve;

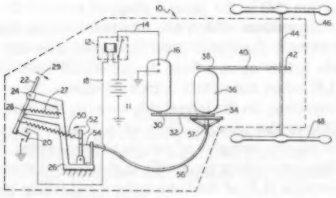
said tension spring being adapted to remain in a first, substantially untensioned state when said intermediate sleeve is fully push-fitted within said first end and said plug is secured within said second end to help insure that the characteristics of said spring do not change, and said spring assuming a second, tensioned state when said inner member and writing instrument is partially withdrawn from said body so that the weight of a letter can be measured by gripping said letter with said holding means holding said outer end portion vertically above said holding unit, the extent of extension of said narrower sleeve from said outer body against the tension of said spring indicating the weight of said letter by reference to said scale.

4,256,196

ELECTRIC VEHICLE WITH WADDINGTON DRIVE

Clive Waddington, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Mar. 15, 1979, Ser. No. 20,752
Int. Cl.³ B60K *25/10*
U.S. Cl. 180—65 E **9 Claims**



1. An electric drive and control system for a vehicle having a frame and a drive wheel rotatably supported by said frame, said system comprising:

a power source supported on the vehicle frame for providing motive energy;

an electric motor mounted on said frame and encircuited to receive energy from the power source, said motor having an output shaft which rotates when said motor is powered by the power source;

a stepless torque responsive automatic transmission mounted on said frame and having an input element and an output element, both being journaled for rotation, said input element being drivingly connected to the output shaft of said motor, said output element being drivingly connected to the drive wheel of said vehicle, said automatic transmission including ratio plate means for establishing the input torque level about which the transmission will change ratio, said transmission automatically adjusting its transfer ratio to accommodate the difference torque requirements between the vehicle drive wheel and the input element;

an accelerator pedal having a pivotal mounting point, said mounting being to the frame of said vehicle;

a first spring having one end attached to the accelerator pedal, the second end of said spring being anchored to said vehicle frame, said spring serving to urge said accelerator pedal to a neutral position;

a tension spring having one end attached to a location on said accelerator which is remote from said pivotal mounting point, thereby allowing the second end of said tension spring to move in and out in response to pressure applied to said accelerator pedal; and

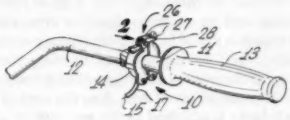
connecting means between the second end of said tension spring and said ratio plate, said connecting means translating pressure on said accelerator pedal to an increased eccentricity of said ratio plate thereby raising the torque requirements at said input element of the transmission.

4,256,197

CRUISE CONTROL

Cecil M. Kiser, Jr., Newkirk, Okla., assignor to NEP Sales, Inc., Glendale, Calif.

Filed Feb. 2, 1979, Ser. No. 8,858
Int. Cl.³ B60K *26/02*; G05G *1/08*
U.S. Cl. 180—335 **6 Claims**



1. A cruise control for a motorcycle or the like having an accelerator control sleeve rotatably mounted on a handle bar and connected by cable means to a throttle, having:

a split body composed of relatively rigid but somewhat flexible plastic material, in the form of two shaped, flat plates in edge-to-edge relation and each defining a generally semi-circular recess in its inner edge portion cooperating with the recess in the other plate to define a central generally circular opening, and first and second end lugs projecting in different directions from the body, and cooperating with the lugs of the other plate to define two gaps extending in different directions from said circular opening;

a connecting link comprised of said plastic spanning the two lugs defining one gap, means fastening said connecting link to said lugs and forming a pivotal connection between the link and at least one lug;

and a selectively operable actuator connected to the two lugs defining the other gap, and including a generally U-shaped head link having two arms straddling the two lugs and a cross-piece across the outer surface of one of the lugs, an adjusting screw threadedly carried by said head link and bearing against said outer surface, means preventing sliding of said screw along said surface, a control lever having one end pivotally mounted between said arms on the outer side of the other of the two lugs, a cam mounted on said lever between said arms, a follower surface on the outer side of said other of the two lugs

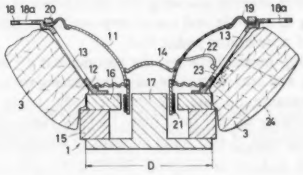
engageable by said cam to force said two lugs together and constrict said opening to frictionally grip the accelerator control sleeve, and an over-center flat on said cam engageable with said follower to hold the actuator releaseably in a clamping condition, thereby to restrain movement of the sleeve.

4,256,198

ACOUSTIC APPARATUS

Yasushi Kawakami, and Hiroshi Iwasaki, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 25, 1978, Ser. No. 927,687
Claims priority, application Japan, Aug. 6, 1977, 52/105280[U]
Int. Cl.³ H04R *7/00*
U.S. Cl. 181—141 **6 Claims**



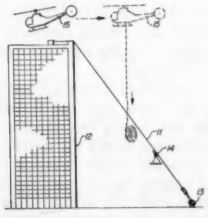
1. Acoustic apparatus comprising a loudspeaker having a cone-shaped diaphragm, a driving unit for driving said diaphragm in response to an electrical signal applied thereto, a framework secured to said driving unit, the outer edge of said cone-shaped diaphragm being resiliently secured to the outer edge of said framework, said framework having a plurality of openings therein to provide communication between a space immediately behind the diaphragm and a space rearwardly of said framework, and an acoustic absorber comprising an air transmissive elastic body of bitumen-containing urethane foam annular in shape and having an axial opening therethrough which opening in the relaxed condition of said body is substantially smaller in cross-sectional area than the area of said driving unit which body is attached to the rear side of said framework by elastically enlarging said opening to cover said plurality of openings and retained in position solely by the elasticity of the body itself, said elastic body comprising a hydrocarbon-containing bituminous compound, a polyol-polydiene and a polyisocyanate.

4,256,199

SELF-POWERED, CABLE-MOUNTED TROLLEYS AND BUILDING RESCUE SYSTEM

Archibald B. Sellards, 4324 E. Southern, Mesa, Ariz. 85206

Filed Jan. 29, 1979, Ser. No. 7,426
Int. Cl.³ A62B *1/02*
U.S. Cl. 182—11 **2 Claims**



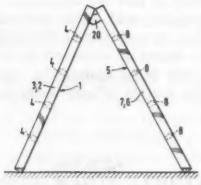
1. A trolley for moving a load along a cable comprising:
(a) an elongate housing having apertures in opposite ends thereof shaped and dimensioned to permit said cable to pass through said apertures and said housing;
(b) pulley means including at least one driven pulley and one idler pulley journaled for rotation within said housing for frictionally engaging said cable passing therethrough;
(c) motor-transmission means carried by said housing for supplying power to said driven pulley;
(d) means for attaching said load to said housing;
(e) attachment means integrated with said elongate housing for quickly attaching and detaching said pulley means to and from said cable, said attachment means including an elongate cover pivotally connected at one end to said housing and detachably connected at the other end to said housing, said cover rotatably carrying said idler pulley such that when said cover is closed said cable is threaded between said drive pulley and said idler pulley; and
(f) gear shift means mounted on said housing and intergrated with said motor transmission means for altering the direction of rotation of said driven pulley.

4,256,200

DOUBLE EXTENDIBLE OR SUPPORT LADDER

Gilbert Loix, Chaussee Brunehault 22, 4462 Jupreller-Wihogne, Belgium

Filed May 21, 1979, Ser. No. 40,724
Claims priority, application Belgium, May 23, 1978, 867361
Int. Cl.³ E06C *1/383*
U.S. Cl. 182—22 **13 Claims**



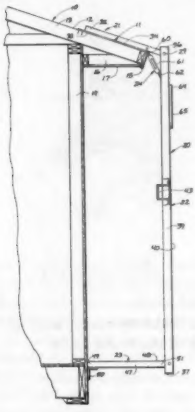
1. A double ladder with rungs which can be folded away-retracted and transformed, without dismantling, into a support ladder or a flat extendible ladder characterised in that each part (**1,5**) is formed by two straight uprights (**2,3** and **6,7**) having an identical section (**9**) in the general shape of a straight open U/channel bar, facing one another and between which identical rungs (**4,8**) are fixed by a pivoting axis (**38**); these rungs have a section (**16**) in the general shape of an open U/channel bar, with dimensions which are less than the section of the uprights; at least one of the parts comprises a device (**34**) for holding the ladder open, a fixed device which is placed below a rung (**4,8**) when the ladder is closed; section (**9**) of the uprights comprising, on the lateral side forming the base, a guide groove (**13**) in the general shape of a T and into which is slipped, in the two uprights of one part of the ladder, the head (**21**) of a flat interlocking piece (**20**), in the general shape of a T, of the two parts (**1,5**) of the ladder; the interlocking piece (**20**) is fixed in a limited pivoting position close to the upper end of the two other uprights of the other part of the ladder so that one of the two parts of the ladder may be simultaneously slid parallel to the other and/or pivoted with respect to the other; uprights of one part of the ladder into which are fixed, parallel to the central part, at least one plate (**29**) termintating in a nose section (**29*a***) in the shape of a hook, emerging from these uprights, a hook part which is placed in a series of slots (**31**) provided at various eye-level heights in the uprights of the other part of the uprights of the ladder, hooks for holding one part of the ladder with respect to the other when it is being used as a flat extendible ladder.

4,256,201

SCAFFOLDING FRAME MEMBERS

James Neighbors, N. 11820 Washington Ct., Spokane, Wash. 99218

Filed Sep. 13, 1979, Ser. No. 75,096
Int. Cl.³ E04G *3/04, 3/12*
U.S. Cl. 182—82 **8 Claims**



1. A scaffolding frame member, for attachment along an exterior wall of a building structure adjacent the roof thereof, comprising:

an elongated rigid channel member having a "U" shaped cross section with a recess extending along its length;

a rigid roof engaging member mounted to the rigid channel member at one end thereof for pivotal movement about a transverse axis and foldable thereon between an open position projecting outwardly of the channel member and a closed position coextensive with the channel member;

turnbuckle means extending between the roof engaging member and channel member selectively operable to urge the roof engaging member about the transverse axis toward the channel member, and foldable with the roof engaging member;

an elongated bottom brace member mounted to the elongated rigid channel at a remaining end thereof for pivotal movement thereon between an open extended operative position, projecting laterally of the channel and a closed storage position coextensive with the channel member; and

fastening means at outward ends of the roof engaging member and bottom brace for securing the frame member to a building structure.

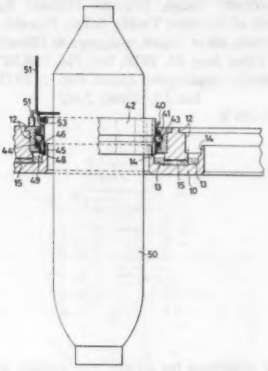
4,256,202

LUBRICATING DEVICE FOR ROTARY RINGS OF SPINNING AND TWISTING FRAMES

Angelo Marzoli, Palazzolo Sull'Oglio, Italy, assignor to F.lli Marzoli & C. S.p.A., Italy

Filed Feb. 16, 1979, Ser. No. 12,767
Claims priority, application Italy, Feb. 22, 1978, 20513 A/78
Int. Cl.³ D01H *7/62*
U.S. Cl. 184—7 A **10 Claims**

1. A lubricating device for rotary rings of spinning and twisting frames, wherein the rotary ring comprises an annular stator body secured in a seat formed in a ring-carrier and an annular rotor body coaxial with and coupled for rotation relative to the stator body by rolling members kept spaced apart from each other circumferentially by a cage, characterized by an oil reservoir having the form of an annular cup formed in the ring-carrier beneath the seat in which the stator body of the rotary ring is secured, in said reservoir the rotor body projects with its lower edge which is spaced apart from the internal wall of the reservoir so as to provide between said internal wall



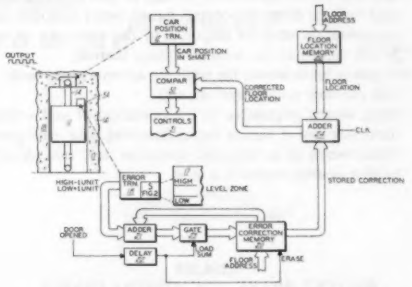
and the lower edge of the rotor by an air-drawing passageway, means being also provided for feeding lubricating oil to said reservoir.

4,256,203

SELF-ADJUSTING ELEVATOR LEVELING APPARATUS AND METHOD

Marvin Masel, Teaneck, N.J., assignor to Otis Elevator Company, Hartford, Conn.

Filed Dec. 18, 1978, Ser. No. 970,784
Int. Cl.³ B66B *1/40*
U.S. Cl. 187—29 R **4 Claims**



1. A self-adjusting elevator car leveling apparatus, comprising,

a position transducer for indicating the location of the car in the shaft,

a first memory for storing approximate floor locations,

a second memory for storing a distance correction for each floor to level the car at the floor,

means for generating, for each floor, an adjusted floor location from said stored floor locations and stored distance correction for each floor,

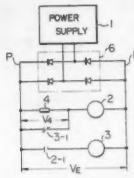
means for comparing said adjusted floor location and said indicated car location to control car movement,

means for modifying a previously stored correction distance for each floor by a predetermined distance increment on each stop at the floor until the car is above a predetermined level zone, and thereupon for modifying a previously stored correction for the floor by said predetermined distance increment on each stop until the car is below said zone, whereby the average car position is within said level zone.

4,256,204
SAFETY APPARATUS FOR ELEVATOR SYSTEM

Takeki Ando, Ibaraki; Seiya Shima; Toshiaki Kurosawa, both of Katsuta; Hiromi Inaba, Hitachi; Hiroaki Kuroha; Hideo Miyao, both of Katsuta; Yoshio Sakai, Ibaraki, and Katuhito Issiki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 31, 1978, Ser. No. 938,347
Claims priority, application Japan, Sep. 2, 1977, 52/104891
Int. Cl.³ B66B 5/02
U.S. Cl. 187—29 R **7 Claims**



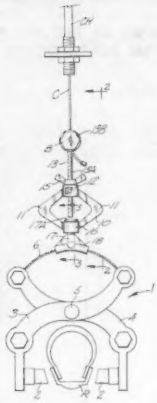
1. A safety apparatus for an elevator system, comprising:
a power supply;
a motor supplied with power by said power supply;
a sheave driven by said motor;
an elevator car operated by the rotation of said sheave;
an electromagnetic brake capable of holding the elevator motion system of said motor, said sheave and said car in a stop condition;
an elevator control device to which power is supplied from said power supply;
voltage drop responsive means being operated in response to the voltage drop of said power supply to a predetermined voltage which is higher than the deenergization voltage of any of the relays included in said elevator control device and lower than the normal voltage of said power supply, said voltage drop responsive means being restored to a nonoperation state in response to the recovery of said power supply to the normal voltage thereof;
emergency brake means for applying an emergency brake to said elevator motion system; and
holding means responsive to the operation of said voltage drop responsive means for maintaining said emergency brake means in an operated condition until said elevator motion system comes to a stop.

4,256,205
BICYCLE BRAKE ADJUSTMENT DEVICE

Douglas A. Hamar, 0236 SW. Palatine Hill Rd., Portland, Oreg. 97219

Filed Jun. 11, 1979, Ser. No. 47,339
Int. Cl.³ B62L 1/12
U.S. Cl. 188—24 **5 Claims**

1. A device for adjustably coupling a caliper type bicycle brake assembly to a brake actuating cable to facilitate brake adjustment without alteration of brake cable length, said device comprising,
a base,
an elongate assembly in threaded lockable engagement at one end with said base, said elongate assembly having a remaining end for attachment to the brake actuating cable,
said base and said elongate assembly adapted for extension and retraction relative one another upon rotational movement therebetween to increase or decrease the overall length of the base and elongate assembly,
coupling means rotatably carried by the base and adapted for engagement with the caliper brake assembly, and
said device upon extension or retraction respectively increasing or decreasing the effective distance between its attachment to the brake cable and to the brake assembly to

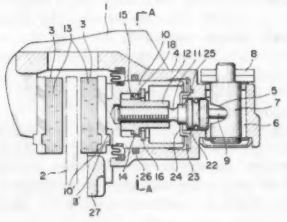


provide desired brake operation without alteration of the effective length of the brake cable.

4,256,206
DISC BRAKE

Toshifumi Maehara, Chichibu, Japan, assignor to Akebono Brake Industry Company, Ltd, Tokyo, Japan

Filed Jun. 28, 1979, Ser. No. 52,944
Claims priority, application Japan, Jun. 30, 1978, 53-80052
Int. Cl.³ F16D 65/56
U.S. Cl. 188—71.9 **4 Claims**



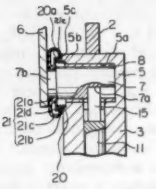
1. A disc brake comprising:
a friction pad being engageable with a disc to be braked;
a piston being slidable within a cylinder and enabling said friction pad to engage said disc by a fluid pressure;
an adjusting bolt;
a sleeve nut being connected with said adjusting bolt by screw threads and engageable with said piston on a release of brake;
a connecting means for transmitting a moving force of said piston toward said disc to said sleeve nut; and
a stopping means of rotation for allowing a forward rotation of said sleeve nut toward said disc and limiting a retracting rotation of said sleeve nut from said disc which comprises wedge means consisting of inclined surface provided on an outer circumference of said sleeve nut and a circumferentially inner surface of said piston, balls provided between said piston and said sleeve nut function as thrust bearing in said connecting means, and spring members pressing said balls to said wedge means for engagement therebetween.

4,256,207

DISC BRAKE

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Division of Ser. No. 860,320, Dec. 14, 1977, Pat. No. 4,184,571.
This application Aug. 10, 1979, Ser. No. 65,741
Claims priority, application Japan, Dec. 20, 1976, 51-170666
Int. Cl.³ F16D *55/30*
U.S. Cl. 188—72.7 **2 Claims**



1. A disc brake comprising a body having a cam member mounting hole and a bore extending transversely thereof and opening into said mounting hole, means defining the open end of said mounting hole where it opens out of said body, a brake lever, a cylindrical cam member connected to the brake lever and rotatably disposed in said mounting hole, a push rod reciprocably positioned in said bore, said cam member having a cam groove therein and said push rod having a recess therein, a connecting member with opposite ends thereof engaging respectively with the cam groove and the push rod to convert rotational movement of the cam member into linear movement of the push rod, and a dust boot disposed between the cam member and the body around the mounting hole, the dust boot having a first annular end portion sealingly contacting said mounting hole defining means around the open end of said mounting hole, a second annular end portion sealingly contacting the outer periphery of the cam member, an annular resilient portion connecting said annular end portions, and sealing means extending between said annular end portions for defining a closed annular space between the inner face of said annular resilient portion and said sealing means, whereby if said annular resilient portion breaks, said sealing means prevents ingress of water or dirt into said mounting hole.

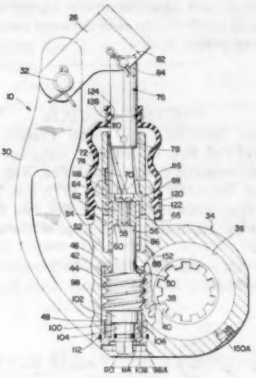
4,256,208

SLACK ADJUSTER

Leonard M. Najer, Southfield, and John A. Urban, Livonia, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1979, Ser. No. 43,587
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—196 D **5 Claims**

1. An automatic slack adjuster for maintaining a predetermined running clearance between the friction members of a cam actuated selectively engageable friction coupling, said slack adjuster comprising: a lever housing, said housing containing a plurality of components to be lubricated, a first bore in the lever housing rotatably receiving a worm gear, said worm gear adapted to be fixed to said cam, a second bore in the lever housing intersecting said first bore and rotatably receiving a worm and worm shaft, said worm drivingly engaged with said worm gear, a third bore in said lever housing coaxial with said second bore, said third bore opening to the exterior of said housing at a sleeve like projection formed integrally with said housing and receiving a drive mechanism in driving engagement with said worm shaft, said drive mechanism including a piston slidably received in said third bore and extending partially therefrom, means for sealing the exterior openings of said first and second bores, a first passage adapted to receive a lubricant fitting between the exterior of said housing and said first bore, a second passage between said first bore and said second bore, the resistance to the flow of lubricant from said fitting to the exterior opening of said third bore being greater than the resistance to the flow of lubricant between said fitting and any of said components, an elastomeric boot for statically sealing the exterior opening to said third bore, one end of said



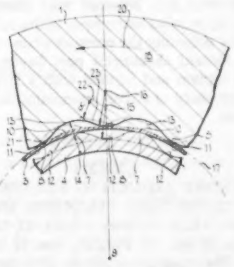
boot sealingly retaining on the exterior surface of said projection, the exterior surface of said projection being substantially smooth and continuous and provided with a continuous annular groove therein.

4,256,209

AXIALLY DISPLACEABLE BRAKE DISC

Hans-Henning Lüpertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,185
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807485
Int. Cl.³ F16D *65/12*
U.S. Cl. 188—218 XL **13 Claims**



1. An arrangement to connect a brake disc to a hub to be braked in a non-rotatable and axially displaceable relationship comprising:

a first plurality of projections disposed on said disc extending toward said hub, each of said first plurality of projections having a first end face aligned parallel to an axis of rotation of said disc and said hub;

a second plurality of projections disposed on said hub extending toward and in a staggered relationship with said first plurality of projections, each of said second plurality of projections having a second end face aligned parallel to said axis of rotation, said first and second end faces being disposed on a common circular arc coaxial with said axis of rotation and disposed between said first and second plurality of projections; and

a preloaded elastic band slightly deviated from said common circular arc disposed between and frictionally engaging

only each of said first and second end faces so that a rotational displacement of said disc due to braking torque will lead to an increase in the preloading of said band by each of said first plurality of projections causing a further deviation of said band from said common circular arc toward said hub between each adjacent two of said second plurality of projections.

4,256,210

FRICTION CLUTCH

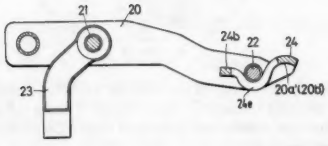
Oswald Dubiel, Bühl/Bd., and Dieter Pretzel, Bühl/Altschweier, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Division of Ser. No. 836,974, Sep. 27, 1977, Pat. No. 4,162,002. This application Apr. 2, 1979, Ser. No. 26,079

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643863

Int. Cl.³ F16D *23/00*

U.S. Cl. 192—99 A **19 Claims**



1. Friction clutch having a housing and levers mounted on the housing for actuating at least one pressure plate, the levers engaging the pressure plate through a connecting linkage, the levers being formed of at least two sheetmetal members and at least two connecting members firmly linking said sheetmetal members to one another, the levers being an assembly of two plate-shaped side walls, said side walls being two substantially flat sheetmetal members extending in a plane perpendicular to the rotational plane of the clutch, the levers being disposed radially to the housing and carrying, the levers being disposed radially to the housing and carrying, in vicinity of the inner radial end thereof and between said sheetmetal members thereat, a run-up member responsive to the action of an actuating member for actuating the pressure plate, said run-up member being a formed sheetmetal part having a substantially sinuous cross section and formed with a loop which closely follows the periphery of a rivet connecting both of said sheetmetal members.

4,256,211

PISTON STROKE ADJUSTING ARRANGEMENT FOR DISC-TYPE FRICTION CLUTCHES AND BRAKES

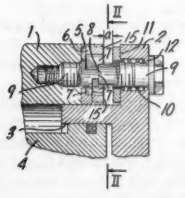
Jury V. Katkov, 3 linia, 11, korpus 2, kv. 63, Moscow, U.S.S.R.

Continuation of Ser. No. 810,288, Jun. 27, 1977, Pat. No. 4,176,738. This application Jul. 6, 1979, Ser. No. 55,281

Claims priority, application U.S.S.R., Jun. 29, 1976, 2380121

Int. Cl.³ F16D *13/75;* **F01B** *31/14;* **F15B** *15/24*

U.S. Cl. 192—111 R **2 Claims**



1. A piston stroke adjusting arrangement for disc-type brakes and clutches comprising, a cylinder housing having a radial groove on an end thereof having two opposed flat sides, a cylinder in said housing, a cylinder end cover closing an end of said cylinder, a bolt extending through said cover into said housing for removably securing the flange cover to said housing, a piston reciprocable in said cylinder, means for varying the clearance between the piston and the cover comprising at least one washer having a multiplicity of paired flat sides for locating it in said groove with opposite flat sides engaging the opposite flat sides of the groove to preclude rotation of said washer in said groove, said bolt extending axially through said washer, said washer having a plurality of alike radial recess of different depth extending radially of said bolt and coaxial therewith, an abutment member having a through opening through which said bolt extends axially, an abutment projection on a face of said abutment member received in a corresponding one of the recesses and rotational about said bolt for selective insertion into different corresponding ones of the recesses in said washer, said abutment projection having a cross section corresponding with the alike recesses for being received therein, wherein the clearance between the cover and the piston is varied in dependence upon into which recess of said abutment projection is received thereby to set the length of the stroke of said piston.

4,256,212

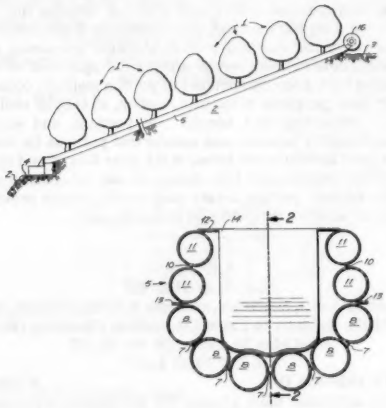
FRUIT COLLECTOR FOR HILLSIDE ORCHARDS

Richard L. Markano, 137 Rancho Camino, Fallbrook, Calif. 92028

Continuation-in-part of Ser. No. 781,217, Mar. 23, 1977, abandoned, and Ser. No. 854,638, Nov. 25, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,174

Int. Cl.³ B65G *11/08, 11/20*

U.S. Cl. 193—7 **9 Claims**



1. A fruit collector for hillside orchards wherein the trees are arranged in sloping rows essentially parallel to the slope of the hillside and transverse essentially level rows, the collector comprising:

a. a tubular chute adapted to be positioned directly upon the hillside between sloping rows of trees whereby fruit from the transverse rows may be brought to opposite sides of the chute;

b. the chute having bottom and side walls formed of inflated tubes, and an essentially flat panel including opposed panel elements joined at their side margins to form a flat tube joining the upper extremities of the side walls and held in spaced relation to the bottom wall by the inflated side walls to complete figuration of the chute thereby to retain the fruit enclosed therein;

c. the panel having a series of access openings spaced essentially the distance between the transverse rows of trees to receive fruit picked therefrom, for gravitational movement to the lower end of the chute;

d. and a fruit retarding ribbon slidably received in the panel for adjustable extension and retraction to vary the length of ribbon received in the chute, thereby to vary the fruit retarding effect of the ribbon.

4,256,213

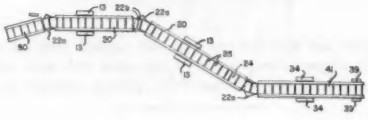
FLEXIBLE MOBILE CONVEYOR

Howard A. Shaw, Indiana County, and John D. Todhunter, Cambria County, both of Pa., assignors to Gordon A. Brewer and Eugene F. Buell, both of Pittsburgh, Pa.

Continuation of Ser. No. 692,668, Jun. 4, 1976, abandoned, which is a continuation of Ser. No. 193,802, Oct. 29, 1971, Pat. No. 3,974,907. This application Sep. 14, 1977, Ser. No. 833,190 The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.³ B65G *41/00*

U.S. Cl. 198—303 **2 Claims**



1. A flexible mobile conveyor comprising a plurality of carriages, a single pair of wheels intermediate the ends of each said carriage supporting each carriage, an endless conveyor mounted on each carriage, drive means on each carriage engaging and driving the conveyor, connections between each successive conveyor whereby a portion of the end of one conveyor of one carriage overlies and feeds onto an end of the conveyor of the next succeeding carriage, each said conveyor having sidewalls extending from end to end on opposite sides, said sidewalls having a flexible portion at one end extending onto the next adjacent conveyor across said overlying portion whereby said flexible portion is free to bend in the plane of the conveyor, means on said portion of the said one conveyor engaging and carried by said end of the next succeeding conveyor, and connections between said carriages including a swivel connection between each pair of carriages permitting generally universal movement between adjacent carriages, a main power source on one of said carriages, drive connections from said main power source driving the pair of supporting wheels in each successive carriage and a final discharge carriage having a conveyor member hinged intermediate its ends and means on the carriage for rotating the conveyor about said hinge to change the elevation of its discharge.

4,256,214

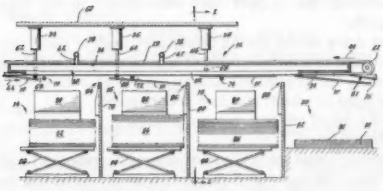
SYSTEM FOR OVERHEAD TRANSPORT OF PANEL MEMBERS

Harry E. Back, Jr., Orangeburg, S.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 27, 1979, Ser. No. 33,973

Int. Cl.³ B65G *47/46*

U.S. Cl. 198—367 **6 Claims**



5. A method of delivering a plurality of panel members to selected locations along a path of travel, comprising the steps of:

releasably suspending said panel members horizontally in aligned, end-to-end relationship beneath a support;

moving said support along said path of travel above said locations;

slidably engaging the upper face of a selected one of said panel members;

applying a downwardly directed force on forward portions of said upper face of said engaged panel member as the latter approaches one of said locations whereby urging said forward portions away from said support and release said forward portions from said support; and

diverting said slidably engaged panel member against the lower edge of a fixed deflection member and away from said support means as the latter is moved along said path whereby to release said slidably engaged panel member from said support and allow gravity induced delivery of said released panel member to said one location.

4,256,215

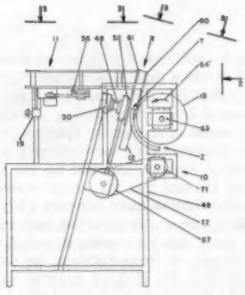
APPARATUS FOR ARRANGING AND TRANSPORTING ARTICLES

Walter Shields, 181-41 Henley Rd., Jamaica, N.Y. 11432

Filed Sep. 4, 1979, Ser. No. 72,729

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—407 **8 Claims**

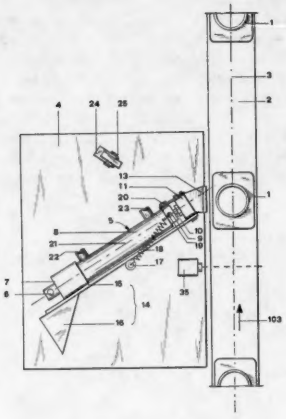


1. An apparatus for arranging and transporting elongated articles, comprising conveyor means for receiving said articles and transferring them with vertical orientation to a first position, a first rotatable wheel in a substantially vertical plane substantially normal to the longitudinal direction of said conveyor means, said first rotatable wheel having a plurality of first recesses distributed about its outer periphery, said first recesses extending radially inwardly from the outer periphery of the first rotatable wheel for consecutively receiving the vertically oriented articles in the recesses from the conveyor means at the first position and transferring the articles to a second position, the second position being substantially 90 degrees from the first position in the direction of rotation of the first wheel, and a second rotatable wheel in a substantially vertical plane normal to the plane of the first rotatable wheel, said second rotatable wheel having a plurality of second axially extending recesses distributed about its outer periphery, said second recesses being formed to consecutively receive said articles from the first recesses at the second position and transferring the articles to a third position angularly displaced from the second position with respect to the axis of the second wheel, whereby the vertically oriented articles transferred to the first position by the conveyor means are transferred to the second position and then to the third position at which the articles are oriented transversely.

4,256,216
APPARATUS FOR EJECTING OBJECTS FROM A CONVEYOR LINE

Thomas B. Winters, Raymond, and Jim H. Priday, Plain City, both of Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 23, 1979, Ser. No. 23,039
Int. Cl.[3] B07C *9/00*
U.S. Cl. 198—488 **10 Claims**



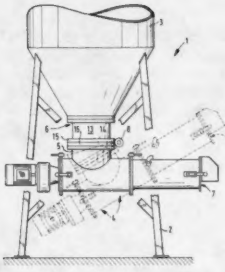
1. Apparatus for ejecting objects from a conveyor line surface of the kind in which three-dimensional objects pass one by one through the field of a detecting device and are ejected as a result of a signal from the detecting device, this ejection taking place by means of an ejecting mechanism comprising at least one motor element firmly mounted on a fixed base and a retractable striking element impelled by the motor element characterized by the fact that the motor element is pivotally mounted on a firm base to pivot between a home position, in which the striking element is retracted, and a deflected position in which the striking element, extended to the full, is carried out of the path of the said objects, the movement of the striking element from the striking position to the deflected position following the direction of travel of the objects, means being provided to return the motor element to its home position.

4,256,217
POSITIONALLY ADJUSTABLE STORING AND CONVEYING APPARATUS FOR MORTAR AND SIMILAR SUBSTANCES

Paul Mathias, Merdingen, Fed. Rep. of Germany, assignor to Mathis Systemtechnik GmbH, Merdingen, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 53,754
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903373
Int. Cl.[3] B65G *47/18, 65/46*
U.S. Cl. 198—536 **23 Claims**

1. A storing and conveying apparatus, especially for use in the production of mortar and similar substances, comprising a substantially upright container including a bottom having at least one discharge opening; a conveyor including a casing having at least one inlet opening and one outlet opening, and at least one conveying element accommodated in said casing and extending from said inlet opening to said outlet opening; means for mounting said conveyor on said container for pivoting at least with respect to a horizontal plane between a first position in which said inlet opening is alignedly juxtaposed with said discharge opening and a second position in which said inlet opening is spaced from and inclined at a given angle relative to said discharge opening; and a tubular intermediate member having two open ends located along planes enclosing said given angle with each other, and interposable between said

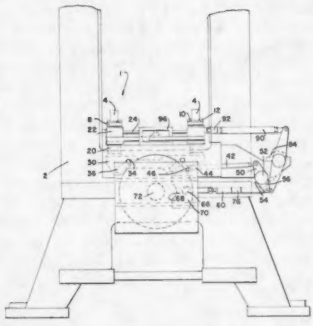


container and said conveyor in said second position of the latter in aligned juxtaposition of said open ends with said discharge opening and with said inlet opening, respectively.

4,256,218
THREE AXIS TRANSFER APPARATUS

Ralph D. Gerben, Glen Burnie, and Harry J. Walters, Fallston, both of Md., assignors to M. S. Willett, Inc., Hunt Valley, Md.

Filed Jun. 27, 1978, Ser. No. 919,591
Int. Cl.[3] B65G *25/02*
U.S. Cl. 198—621 **6 Claims**



1. Transfer apparatus comprising
a pair of spaced gripper bars extending along a transport path,
axial moving means connected to the gripper bars for moving the gripper bars in the direction of the transport path,
vertical moving means connected to the gripper bars for moving the gripper bars in the vertical direction,
transverse moving means connected to the gripper bars for moving the gripper bars transversely to the transport path,
cam drive means having three cams, each of said cams connected to a different one of said moving means for generating the gripper bar motion associated with said moving means to which said cam is connected,
said vertical moving means comprising,
a base frame,
a lifting frame vertically movable with respect to said base frame having spaced diagonal slots provided in a vertical plate,
horizontally extending guide pins provided on the base frame projecting into the slots,

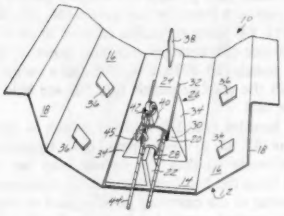
one of said cams connected to the lifting frame for moving the lifting frame with respect to the base frame thereby urging the lifting frame against the guide pins and vertically moving the lifting frame.

4,256,219

CABLE OR CHAIN ACTUATED CHIP CONVEYOR

G. Wayne Lybecker, 123 Clair Hill Dr., Rochester, Mich. 48063

Filed Jul. 23, 1979, Ser. No. 60,018
Int. Cl.³ B65G *25/04*
U.S. Cl. 198—747 **5 Claims**



1. A conveyor for moving items comprising:

a trough for collecting items including a bottom wall and a pair of side walls;

a harpoon which when moving in a rearward direction through a pile of chips passes through the chips without displacing the chips in the direction of movement of the harpoon, and when moving in a forward direction displaces the chips in the direction of movement of the harpoon; and

a cable or chain means for urging the harpoon in the rearward direction and the forward direction said cable or chain means comprising:

a first capstan;

first means for rotating the first capstan in a first direction and a counter direction;

a first end of a first cable looped one or more turns around the capstan and affixed thereto;

a central portion of the first cable affixed to one end of the harpoon;

a second capstan;

second means for rotating the second capstan in a first direction and a counter direction;

a first end of a second cable looped one or more turns around the second capstan and affixed thereto;

a central portion of the second cable affixed to the other end of the harpoon;

wherein rotating the first and second capstans in a first direction moves the harpoon in the forward direction, and rotating the first and second capstans in a counter direction moves the harpoon in the rearward direction.

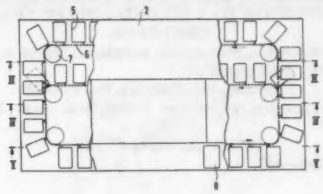
4,256,220

COMPONENT-INSERTION TABLE FOR PRINTED WIRING BOARDS

Alfred Lemmer, Machtlfingerstrasse 24, D-8000 Munchen 70, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,056
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 7712802[U]
Int. Cl.³ B65G *13/02*
U.S. Cl. 198—778 **3 Claims**

1. A component-insertion table for wiring boards comprising a hollow table top of relatively short height supported on top of relatively long legs, an endless chain belt to which pickup trays for the components are secured, and guide means arranged to support said endless chain belt for movement in said hollow table top, said guide means being disposed to support said chain belt in two stacked loops, each loop extending around the table top in a different plane except for a single portion of each loop which extends from one plane to the



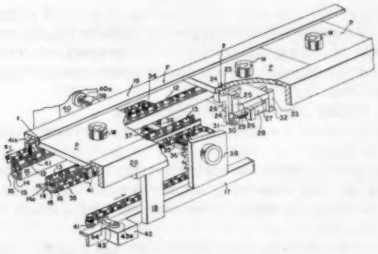
other, said single portions of each loop being laterally offset relative to each other.

4,256,221

WORKPIECE ASSEMBLY MACHINERY

Ronald G. Lain, Bay City, Mich., assignor to RWC, Inc., Bay City, Mich.

Filed Sep. 26, 1979, Ser. No. 79,097
Int. Cl.³ B65G *47/31, 15/64, 37/00*
U.S. Cl. 198—345 **4 Claims**

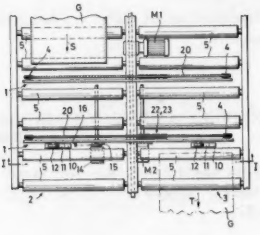


1. In a workpiece assembly machine having a plurality of work stations arranged at intervals therealong; a conveyor line for moving parts on pallets intermittently along the conveyor line; there being pallet stops provided at various stations under the control of the operators to halt a pallet at the station while an operation is being performed thereon; said line having a generally horizontal first conveyor run portion on which said pallets are frictionally supported for travel at a predetermined linear rate of speed; means for driving said run portion; a second conveyor interjacent the ends of the conveyor line mounting spaced apart pallet control elements for travel in a path extending co-parallelly with and adjacent said first run portion, and of a length to extend along only a part of the first conveyor run portion; means for driving the second conveyor at reduced speed; said pallet control elements being provided on said second conveyor to project therefrom into the path of pallets frictionally carried on the first conveyor and prevent the pallets from moving at the faster rate of travel thereof before releasing them to travel at the speed of the first conveyor run portion again; a stop element movable into and out of the plane of movement of pallets on said faster moving first conveyor run portion to normally impede a pallet frictionally carried thereon; a control provided to release said stop element and pass a single pallet to travel; an activator provided to operate said control when a pallet control element on the second conveyor reaches a predetermined position; and said pallet control elements on the second conveyor being spaced apart relative to their speed of travel, the speed of travel of the first conveyor, and the position of said stop element such that there is time before the release of a subsequent pallet for an assembler to grasp and temporarily halt travel of a pallet before permitting it to assume its travel.

4,256,222
TRANSFER CONVEYOR FOR THE TRANSFER OF PIECE GOODS FROM A FIRST ROLLER TRACK CONVEYOR TO A SECOND ROLLER TRACK CONVEYOR

Rolf Gunti, Laufen, Switzerland, assignor to Masyc A.G., Munchenstein, Switzerland

Filed Aug. 24, 1978, Ser. No. 936,629
Claims priority, application Switzerland, Aug. 25, 1977, 10419/77
Int. Cl.³ B65G *47/52*
U.S. Cl. 198—457 **9 Claims**



1. A transfer conveyor apparatus suitable for the optional transfer of piece-goods from a first roller track conveyor to a second roller track conveyor, said transfer conveyor apparatus comprising:

(a) a transfer conveyor including,

(i) at least one endless, flexible filamentary conveying element,

(ii) guiding means for said conveying element, operable to guide said conveying element around an endless path including an upper, conveying run and a lower, return run, and

(iii) a first driving motor for driving said guiding means;

(b) a base;

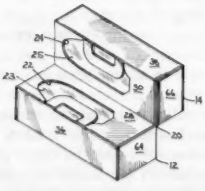
(c) means mounting said transfer conveyor on said base for upward and downward movement with respect to said base, and comprising stationary ramps carried by said base and rollers rotatably mounted on said transfer conveyor and engaging said ramp; and

(d) a second driving motor mounted on said base for moving said transfer conveyor horizontally and thereby raising said transfer conveyor vertically.

4,256,223
DUAL COMPARTMENT DISPLAY CARTON

Thomas D. Pawlowski, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Sep. 13, 1979, Ser. No. 75,250
Int. Cl.³ B65D *5/46, 25/54, 25/28*
U.S. Cl. 206—45.11 **9 Claims**



1. A display carton comprising:

first and second display panels (**28, 30**) hinged together by a common scoreline (**20**), each of the display panels (**28, 30**) having a display window opening (**22, 24**) cut therein;

a top panel (**36, 38**) joined to each of the display panels (**28, 30**);

a side panel (**56, 58**) joined to each of the top panels (**36, 38**);

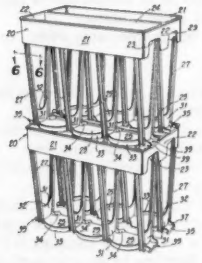
a bottom panel (**80, 82**) joined to each of the side panels (**56, 58**), each of the bottom panels (**80, 82**) also joined to the respective display panel (**28, 30**) thereby defining a first compartment (**12**) by a one of the display panels (**28**), the top panels (**36**), the side panels (**56**) and the bottom panels (**80**), and a second compartment (**14**) by the other of the display panels (**30**), the top panels (**38**), the side panels (**58**), and the bottom panels (**82**); the first and second compartments (**12, 14**) being joined hingedly together by the scoreline (**20**) joining the display panels (**28, 30**) together opposite from the top panels (**36, 38**), the compartments (**12, 14**) being pivotable relative to each other along the scoreline (**20**) between a display position, in which the display panels (**28, 30**) are visible, and a carrying position, in which the display panels (**28, 30**) are held in abutting relation; and

a pair of handles (**16, 18**) each of which is attached by a scoreline (**40, 42**) to the top panel of a respective one of the compartments so that the carton may be carried suspended from the handles when the compartments (**12, 14**) are pivoted to the carrying position and so that when the carton is carried suspended from the handles in the carrying position, the display panels (**28, 30**) are held pressed together, by the hinge (**20**) therebetween on one side and by the paid of handles (**16, 18**) on the other side thereof, to conceal the contents of the carton and to prevent the contents of the compartments from protruding through the window opening (**22, 24**) in each of the display panels.

4,256,224
NESTABLE AND STACKABLE SIX-BOTTLE CARRIER

Kashichi Hirota, Hachioji, Japan, assignor to Kyowa Electric & Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 70,168
Int. Cl.³ B65D *1/38, 1/24, 21/02, 25/04*
U.S. Cl. 206—203 **16 Claims**



1. A nestable and stackable bottle carrier of unitized construction comprising a top substantially rectangular marginal frame, a carrying handle bar disposed within said frame in spaced parallel relationship with opposite sides of the frame and being connected at its opposite ends to the opposite ends of said frame, plural bottle receptor cells in two discrete rows longitudinally of said frame and depending therefrom, each cell having a substantially level base and having suspension struts rising from said base in a rectangular spaced array and including inner and outer pairs of struts for each cell having their tops joined respectively to the carrying handle bar and to the sides of said frame which are parallel to the handle bar, the struts for each cell converging downwardly at least in planes defining said discrete rows of cells to promote nesting of the bottle carrier with other like bottle carriers, and bottom stacking projections on opposite ends of the bottle carrier adapted to rest solidly on the upper edge of corresponding frame ends of an underlining like bottle carrier, said corresponding frame

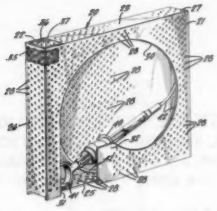
ends having clearance openings to receive said stacking projections in the process of nesting and de-nesting of bottle carriers.

4,256,225

FIBEROPTIC ENDOSCOPE ACCESSORY INSTRUMENT STORAGE CASE

Frank W. Jackson, Twillingate, R.D. 3, Mechanicsburg, Pa. 17055

Filed Jul. 30, 1979, Ser. No. 61,947
Int. Cl.[3] B65D *85/02, 83/00*
U.S. Cl. 206—303 **1 Claim**



1. A fiberoptic endoscope accessory instrument having
(a) a thin, long, flexible, substantially straight portion capable of being coiled into circular form, the flexible portion being biased toward the substantially straight relaxed position from the circular form;
(b) an operating end at one end of the flexible portion; and
(c) a tip end on the flexible portion opposite the operating end;
in combination with an accessory instrument storage case in the form of a flat rectangular-shape having
(a) opposing side walls on the flat side of the case with one of the case side walls having a central circular opening with a slot adjacent to, and integral with, the circular opening;
(b) opposing end walls on the front and back of the case;
(c) a top and bottom wall; and
(d) the walls of the case perforated;
wherein
(a) the accessory instrument is coiled into circular form outside the case to a diameter substantially the same as the circular opening in the case, with the operating end at one point in the coil and the tip at another point in the coil;
(b) the coiled instrument is inserted into the case, and subsequently withdrawn from the case, by a person grasping the coil at the point on the coil where the handle is located;
(c) the point on the coil where the handle is located being positioned within the case at the location of the slot in the side wall;
(d) the instrument is stored within the case in coiled form;
(e) the instrument seeks to expand when it is within the case, from the coiled form to a straight position; and
(f) the case restrains the coiled instrument from expanding whereby the walls of the case secure the instrument within the case.

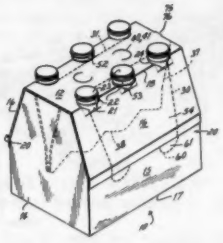
4,256,226

BOTTLE CONTAINER AND METHOD OF ERECTING AND LOADING THE SAME

Orison W. Stone, New Haven, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Filed Jul. 19, 1979, Ser. No. 58,850
Int. Cl.[3] B65D *5/44, 5/46, 5/54*
U.S. Cl. 206—427 **11 Claims**

1. A returnable container for glass bottles comprising,
a tube formed by a bottom wall, two end walls and a top wall,
an internal brace comprising a cross panel glued to the underside of said top wall and two depending panels in the



center of said tube, said brace extending between said end walls,
and side walls enclosing bottles within said tube,
said side walls having a perforated upper portion creating a removable access panel.

4,256,227

FROTH FLOTATION METHOD FOR RECOVERING METAL VALUES FROM THEIR ORES BY THIOUREA OR SUBSTITUTED THIOUREA

Vojislav Petrovich, 1935, W. Schiller St., Chicago, Ill. 60622

Filed Apr. 23, 1979, Ser. No. 32,455
Int. Cl.[3] B03D *1/02*
U.S. Cl. 209—166 **7 Claims**

1. In concentrating by froth flotation of copper, nickel, silver, mercury, bismuth, and lead metal values from their ores, which includes subjecting of such ore material when finely ground to froth flotation process in the presence of thiourea or methylisobutyl carbinol thiourea, and in the presence of acids selected from the group consisting of hydrochloric, nitric, sulfuric, phosphoric, oxalic, potassium ferrocyanide, potassium thiocyanate and potassium cyanide which additions acting in conjunction form addition compounds a the mineral surface; the step of adding to the mineral slurry an amount of the order from 0.01 to 0.05 kg per ton of ore treated of thiourea, or substituted thiourea, and an amount of the order from 0.01 to 0.1 kg per ton of ore treated of said acids or salts in a slightly acid, neutral, or slightly alkaline pulp of mineral slurry, and an adequate amount of a convenient frother; said additions to aqueous dispersion of ore produce a float product of copper, nickel, silver mercury, bismuth, or lead value by continous agitation and aeration of the aqueous dispersion of mineral slurry; and separating and recovering the said metal values as float concentrate products.

4,256,228

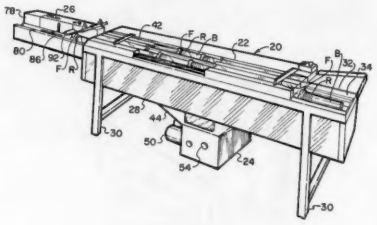
APPARATUS FOR REMOVING ROVING OR THE LIKE FROM TEXTILE BOBBINS OR THE LIKE

Robert E. Terrell, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.

Filed Apr. 27, 1978, Ser. No. 900,761
Int. Cl.[2] B07C *5/00*
U.S. Cl. 209—600 **10 Claims**

1. Apparatus for selectively removing bobbins or the like with residual roving or the like thereon from a row of advancing bobbins, said apparatus comprising means for supporting advancing bobbins, means for sensing bobbins supported on said supporting means with residual roving remaining thereon, means responsive to said sensing means for selectively removing sensed bobbins from said supporting means while allowing other bobbins to pass along said supporting means, said bobbin supporting means having an offset section with the initial portion thereof spaced generally one or a multiple bobbin

length from said sensing means and disposed to be out of bobbin contact as a bobbin advances into said offset section while being contacted by the trailing end of a bobbin upon lateral movement thereof as it enters said initial portion of said offset



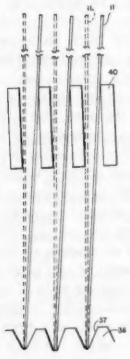
section, means in said initial portion of said offset section responsive to a bobbin trailing end in said initial portion of said offset section for temporarily deactivating said sensing means to allow a bobbin leading end to pass said sensing means without activation thereof.

4,256,229

BOAT FOR WAFER PROCESSING

Steven N. Lee, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 17, 1979, Ser. No. 76,045
Int. Cl.³ B05C *13/02*
U.S. Cl. 211—41 **7 Claims**



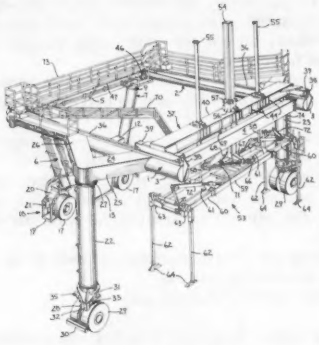
1. A boat for holding wafers during processing, comprising:
a bottom plate having a major surface comprising a plurality of substantially parallel V-groove notches extending from a first edge of said plate to a second edge of said plate;
a first guiding rail connected to said bottom plate and disposed above and adjacent said first edge of said bottom plate, said rail including a plurality of U-shaped notches having a substantially flat bottom, each of said U-shaped notches corresponding to a respective one of said V-groove notches, said U-shaped notches being disposed with respect to said bottom plate so that the normal from a point on one side of each of said U-shaped notches where a wafer placed in said U-shaped notch contacts said one side falls substantially on the line representing the extension of the apex line in the corresponding V-groove notch in said bottom plate;
a second guiding rail connected to said bottom plate and disposed above and adjacent to said second edge of said bottom plate, said rail including a plurality of U-shaped notches having a substantially flat bottom, each of said U-shaped notches corresponding to a respective one of said V-groove notches, said U-shaped notches being disposed with respect to said bottom plate so that the normal from a point on one side of each of said U-shaped notches were a wafer placed in said U-shaped notch contacts said one side falls substantially on the line representing the extension of the apex line in the corresponding V-groove notch in said bottom plate and said one sides of the U-shaped notches, corresponding to a common said apex line, being aligned; and
the normal from a point on the respective other side of each of said U-shaped notches, where a wafer placed therein contacts said other side, falls beyond the nearest corner of the corresponding V-groove notch.

4,256,230

CANTILEVER STRADDLE CARRIER

Clinton B. Clark, Jr., 8360 SW. 184th La., Miami, Fla. 33157; Scott S. Corbett, Jr., 6412 SE. 29th, Portland, Oreg. 97202, and Allen E. Van Duyn, 17140 29th Ave. North, Wayzata, Minn. 55391

Filed May 31, 1979, Ser. No. 44,079
Int. Cl.³ B66C *5/02*
U.S. Cl. 212—216 **5 Claims**



1. In a straddle carrier the combination comprising:
(a) an elevated frame having a pair of horizontally disposed side beams that are parallel to and spaced from one another;
(b) a hoist trolley bridging between said side beams that travels along the length of the beams;
(c) load lifting means carried by said trolley for suspending a load beneath the trolley;
(d) a pair of upwardly rising rear support columns supporting said elevated frame at the after end thereof;
(e) an undercarriage extending between the lower ends of said rear support columns;
(f) prime moving machinery carried by said undercarriage;
(g) a pair of ground engaging wheels supporting said rear support columns and undercarriage; and
(h) a pair of upwardly rising forward support columns supporting said elevated frame that are each disposed outward to the side of one of said side beams at a position rearward of the front of said side beams to have the side beams cantilever forward of the forward support columns, said rear support columns rise obliquely to the vertical to downwardly converge toward one another with a distance therebetween at the lower ground engaging ends less than one-third the distance between the lower ground engaging ends of said forward support columns.

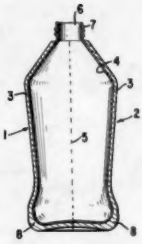
4,256,231
CONTAINER WITH A SYNTHETIC LINING IMPERMEABLE TO LIQUIDS AND METHOD OF MAKING

Alexander Cioc, Düsseldorf; Werner Künzel, Langenfeld, and Klaus Meyer, Kaarst, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 955,161, Oct. 27, 1978, abandoned, which is a division of Ser. No. 843,501, Oct. 19, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 973,794

Int. Cl.³ B65D *23/02*

U.S. Cl. 215—1 C **11 Claims**



1. A necked container comprising an outer shell and a one-piece inner liner, said outer shell consisting of two mated parts formed from a material selected from the group consisting of cellulose, pasteboard, cardboard and a mixture thereof, said parts being abutted together at a mating seam, said liner being a liquid-impermeable thermoplatic material and being thermoplastically bonded to said mated parts to fuse said mating parts together, said shell being that component of said container that lends structural rigidity thereto.

4,256,232
POWDER COMPOSITION AND METHOD OF PREPARATION

Martin J. Hannon, Martinsville, and Alex S. Forschirm, Parsippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 971,176, Dec. 20, 1978, which is a division of Ser. No. 844,963, Oct. 25, 1977, Pat. No. 4,163,031. This application Sep. 27, 1979, Ser. No. 79,290

Int. Cl.³ B65D *11/16;* **B05D** *3/02, 1/36*

U.S. Cl. 215—12 R **12 Claims**

1. A glass container coated on its outer surface to prevent the scattering of glass fragments, said coated glass container comprising

(A) a glass container, and

(B) a powder composition intimately contacted on the external wall of said container comprising a melt blend mixture of from about 25 to about 90 by weight of

(1) a block copolymer which is selectively hydrogenated to at least some degree and having at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,

(a) each A is a polymer end block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said blocks A comprising from about 5 to about 50% by weight of the total block copolymer, and

(b) each B is a polymer mid block having a number average molecular weight of from about 30,000 to about 300,000, and formed from a conjugated diene selected from homopolymers of at least one conjugated diene having 4 to 10 carbon atoms per molecule, said block B comprising from about 50 to about 95% by weight of the total block copolymer, and

(2) from about 10 to about 75% by weight of at least one melt flow modifier selected from the group consisting of

(a) monovinyl arene homopolymers,

(b) alpha alkyl monovinyl arene homopolymers, and

(c) copolymers of monovinyl arenes and alpha alkyl monovinyl arenes, wherein the aromatic portions of the polymers described in (2) (a), (b), and (c) are at least partially hydrogenated to remove the aromatic character thereof.

4,256,233
BLANK FOR A BOTTLE CAP

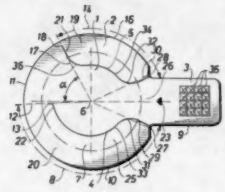
Sune Harding, Partille, Sweden, assignor to AB Wicanders Korkfabriker, Sweden

Filed Feb. 10, 1978, Ser. No. 876,728

Claims priority, application Sweden, Feb. 24, 1977, 7702037

Int. Cl.³ B65D *41/42*

U.S. Cl. 215—254 **17 Claims**



1. A blank for forming a sealing cap, said blank comprising a flat sheet of metal defining an inner circular upper cap part and an annular peripheral side part surrounding the upper part, and tear-off means extending radially outwardly from the said side part of the blank, there being two score lines in the material forming the blank, the score lines extending from the vicinity of the tear-off means to positions on the opposite side of a central part of the blank, the score lines being asymmetrical and terminating in regions adjacent the edge of the blank, the arrangement being such that the distance clockwise from one side edge of the tear-off means along the first part of the outer peripheral edge of the side part of the blank to a first radius extending from the central point of the blank through the end point of a first one of the score lines is substantially different from the distance counter clockwise from the other side edge of the tear-off means along a second part of the outer peripheral edge of the side part of the blank to a second radius extending from the central point through the end point of the second score line.

4,256,234
CONTAINER CLOSURE HAVING EASILY OPENABLE LINER COMPRISED OF BASE RESIN, LUBRICANT AND 1 TO 15% BY WEIGHT OF A CONJUGATED DIENE RESIN

Fumio Mori, Yokohama; Junichi Itsubo, Hiratsuka; Gunji Matsuda, Isehara; Shigeru Nagashima, and Kozo Nakamura, both of Hiratsuka, all of Japan, assignors to Japan Crown Cork Co. Ltd., Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 964,883

Int. Cl.³ B65P *53/00;* **C08L** *23/16*

U.S. Cl. 215—343 **7 Claims**

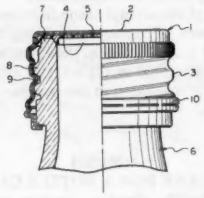
1. A container closure comprising a closure shell and an easily openable liner for sealing bonded to the interior of said closure shell, said liner being composed of a composition comprising

(I) a base resin consisting of

(a) 95 to 30% by weight of a highly crystalline polyolefin and

(b) 5 to 70% by weight of a lowly crystalline or amor-

phous ethylene polymer selected from the group consisting of a copolymer of ethylene with propylene or butene-1 and a terpolymer of ethylene with propylene and a non-conjugated diene.



(II) a lubricant in an amount of 0.001 to 5% by weight based on said base resin, and

(III) a polymer containing at least 10% by weight of a conjugated diene in an amount of 1 to 15% by weight based on said base resin.

4,256,235

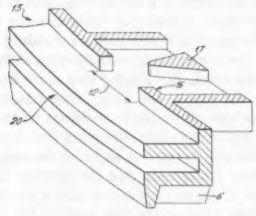
DRUM FOR LAUNDRY HANDLING MACHINE

Herbert F. Klamandt, Altena, Fed. Rep. of Germany, and Jacques Colley, Liege, Belgium, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 607,747, Aug. 26, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,895

Int. Cl.³ B65D *6/24*

U.S. Cl. 220—4 F **3 Claims**



1. A washing machine drum particularly constructed for a low cost laundry machine comprising:

a pair of circular shaped side walls made from a synthetic material;

a partially perforated casing made from a synthetic material positioned between and joining said side walls forming a cylindrical shaped member enclosing the space between said side walls except for an open portion; and

a door for said open portion;

at least one of said side walls having toothed ring portion formed on one outside edge thereof which is adapted to mate with a driving pinion associated with said laundry machine;

each of said side walls having a pair of slightly spaced apart circular grooves peripherally located adjacent its outer edge,

the outer of each of said grooves being adapted to receive the opposing edges of said door and to allow for sliding movement of said door therein for opening and closing said open portion, and

the inner of said grooves having a plurality of peripherally spaced openings formed through each of said side walls, each of said openings through said side walls having a first outer width, a pair of locking parts and a wider inner width,

said casing having a plurality of pairs of spaced apart somewhat resilient stud-like protrusions formed on each lateral edge adapted to mate with said plurality of openings formed through said inner peripheral groove of said side walls,

each of said stud-like protrusions having a tapered portion and a locking shoulder portion formed thereon adjacent its outer end, said protrusions being spaced apart by an amount which is less than said first outer width through said openings of said side walls and being adapted to be forced toward each other to penetrate through said first outer width of said openings and then to move outwardly whereby said locking shoulders hook onto and are supported on said locking parts of said openings through said side walls.

4,256,236

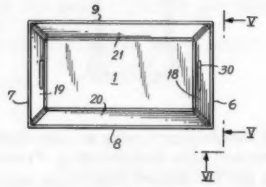
COLLAPSIBLE CONTAINER FOR MILK CARTONS

Samuel Haase, 61-20 Grand Central Pkwy., Forest Hills, N.Y. 11375

Filed Oct. 29, 1979, Ser. No. 88,948

Int. Cl.³ B65D *8/14, 6/16*

U.S. Cl. 220—6 **6 Claims**



1. A collapsible container, said container comprising

a plate-like base member having first and second spaced parallel edges and third and fourth spaced parallel edges perpendicular to the first and second edges, first and second upper ledges extending upward substantially perpendicularly from said base member along the first and second edges thereof and third and fourth upper ledges extending upward substantially perpendicularly from said base member along the third and fourth edges thereof, said third and fourth upper ledges being substantially perpendicular to said first and second upper ledges, each of said first, second, third and fourth upper ledges having spaced opposite first and second ends with a first hole formed therethrough at the first end and a second hole formed therethrough at the second end;

a first side panel pivotally mounted in said third and fourth upper ledges next-adjacent said first upper ledge in a manner whereby said first upper ledge prevents the first side panel from falling outward;

a second side panel pivotally mounted in said third and fourth upper ledges next-adjacent said second upper ledge in a manner whereby said second upper ledge prevents the second side panel from falling outward;

a third side panel pivotally mounted in said first and second upper ledges next-adjacent said third upper ledge in a manner whereby said third upper ledge prevents the third side panel from falling outward; and

a fourth side panel pivotally mounted in said first and second upper ledges next-adjacent said fourth upper ledge in a manner whereby said fourth upper ledge prevents the fourth side panel from falling outward, said side panels being maintained upright by cartons supported on said base member and collapsing inward toward said base member in the absence of cartons on said base member, each of said first, second, third and fourth side panels having a pair of spaced opposite side edges, a first pin extending from one of said side edges and accommodated in a corresponding hole through a corresponding one of said upper ledges and a second pin extending from the other of said side edges and accommodated in a corre-

sponding hole through a corresponding other of said upper ledges.

4,256,237

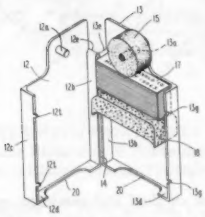
PLASTIC DISPENSER FOR LABELS

John W. Desmond, 104 Walter Dr., Media, Pa. 19063

Filed Sep. 21, 1979, Ser. No. 77,659

Int. Cl.³ B65H *3/06, 3/58*

U.S. Cl. 221—26 **6 Claims**



1. In a label dispenser capable of allowing individual removal of successive ones of a plurality of flexible labels arranged in a stack and secured at only one edge thereof to each other by adhesive along one side of the stack, the dispenser comprising a receptacle for containing the stack, a pusher for urging the stack in a direction within the receptacle such that the secured edge of the outermost label lies adjacent a first opening in the receptacle, and a friction roller within the receptacle for contact with the outermost label for causing a force component to be applied to the outermost label for movement thereof out of the receptacle whereby the outermost label may be removed from the stack by manually tearing at its secured edge, the improvement wherein said receptacle comprises two complementary plastic wall sections joined together by an integral flexible hinge along one side of said receptacle, interlocking structure at the opposite side of said receptacle to hold said sections in closed position, and said sections supporting structure comprising aligned projections integral with said sections within said receptacle adjacent said first opening thereof to provide an axle for the friction roller.

4,256,238

ESCAPEMENT ASSEMBLY FOR FASTENING FEEDING APPARATUS

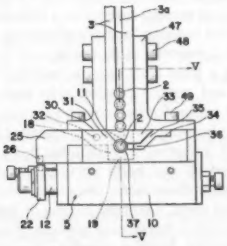
Takao Naitou, Katano, and Toshio Tsuzuki, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 23, 1979, Ser. No. 60,031

Claims priority, application Japan, Jul. 27, 1978, 53-92243

Int. Cl.³ B65G *59/06*

U.S. Cl. 221—263 **2 Claims**



1. An escapement assembly for successively receiving individual fasteners which have been transported thereto in a row by means of a chute assembly and for feeding the fasteners to a desired handling station one at a time through a transport tubing, which comprises:

an escape passage having first and second ends opposite to each other, the second end of the escape passage means being adapted to have the transport tubing connected thereto; and

a nail plate means positioned adjacent the chute assembly and above the first end of the escape passage means, said nail plate means being supported for reciprocal movement in a direction at right angles to the longitudinal axis of the chute assembly for separating individual fasteners from the row and for subsequently transporting the separated fastener towards the first end of the escape passage means, said nail plate means including a separating finger for moving across the path of movement of the fasteners from the chute assembly to the escape passage means during each reciprocal movement of the nail plate means for separating individual fasteners from the row, said nail plate means having an aperture defined therein having a size sufficient to allow a head portion of each of the fasteners to pass therethrough, said aperture being aligned with the escape passage when the nail plate means is moved to the end of its path of movement in one direction, said nail plate means further having an elongated groove having one end adjacent said separating finger for receiving the separated fastener, a substantially intermediate groove portion extending from said one end and inclined relative to the longitudinal axis of the chute assembly, and a parallel groove portion extending parallel to the direction of movement of the nail plate means and having one end connected to the other end of the inclined groove portion and the other end connected to the aperture, whereby said parallel groove portion serves to temporarily hold the separated fastener which has been transported thereto through the inclined groove portion during the movement of the nail plate means for making sure it is in the proper position to fall into said escape passage means.

4,256,239

EASILY OPENABLE COVER MEMBER

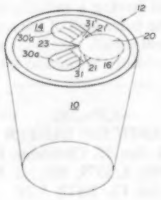
Kisaburo Yamaguchi, Hachioji, and Tsukasa Yoshikawa, Yamato, both of Japan, assignors to Tokan Kogyo Kabushiki Kaisha, Japan

Filed Jul. 9, 1979, Ser. No. 55,909

Claims priority, application Japan, Oct. 19, 1978, 53/142787[U]; Oct. 23, 1978, 53/145655[U]

Int. Cl.³ B65D *41/32*

U.S. Cl. 220—270 **5 Claims**

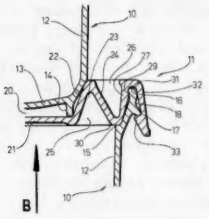


1. An easily openable integrally injection-molded cover member for a container which cover member includes a cover sheet formed from synthetic resin of high flexibility and having an integral openable portion defined by a thinned portion on said cover sheet and unsealing means contiguous to said openable portion for removing the openable portion from the cover sheet,

characterized in that said unsealing means comprises a pair of tongue-shaped strips each of which extends over said cover sheet and integrally from the openable portion so as to define a stress-concentrated point upon the thinned portion therebetween, whereby when said unsealing means is moved up from said cover sheet, said stress-con-

centrated point is first sheared off, then, said openable portion is continuously removed from the cover sheet together with the unsealing means.

4,256,240
CONTAINER CLOSURE
Peter A. Woinarski, Woollahra, Australia, assignor to Innovative Design Company Pty. Limited, Woollahra, Australia
Filed Oct. 22, 1979, Ser. No. 87,399
Claims priority, application Australia, Nov. 1, 1978, PD6601
Int. Cl.[3] B65D *43/10, 21/02*
U.S. Cl. 220—306 **9 Claims**



1. A closure for a container which has a rim surrounding its opening and a ledge forming a portion of the internal wall of the container;

the closure being formed from a resilient plastics material and comprising:

a central well having a base and a bordering wall,

an inverted annular first channel which borders the well, the first channel having a radially inner wall which constitutes the wall of the well, a radially outer wall, and partitioning means interconnecting the inner and outer walls whereby said walls are restrained from moving one relative to the other,

a non-inverted annular second channel bordering the first channel, the second channel having a radially inner wall which is constituted by the outer wall of the first channel and a radially outer wall, the outer wall of the second channel being movable relative to the inner wall of the second channel, and the second channel having a base portion at the bottom of the outer wall of the first channel which is arranged to seat on the ledge of the container when the closure is fitted to the container, and

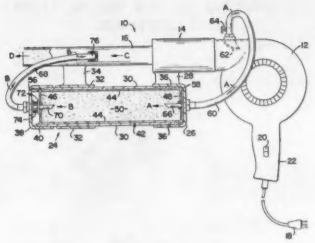
an inverted annular third channel bordering the second channel and arranged to receive the rim of the container, the third channel having a radially inner wall which is constituted by the outer wall of the second channel and a radially outer wall which surrounds the rim of the container when the closure is fitted to the container.

4,256,241
PESTICIDE DUSTER
Robert S. Mesic, P.O. Box 95, Christmas, Fla.
Filed Feb. 1, 1979, Ser. No. 8,535
Int. Cl.[3] B67B *7/24*
U.S. Cl. 222—85 **8 Claims**

1. A fluid-solid mixing and dispensing apparatus of the type primarily intended for use in applying pesticides by dusting, said apparatus comprising, in combination:

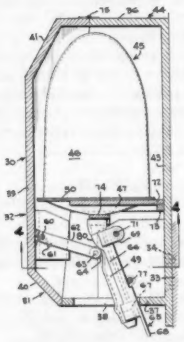
fluid blower means whereby a main flow of fluid is provided;

cartridge receiver means formed on said blower means in fluid-communicating relation to a portion of the fluid delivered by said blower means, said cartridge receiver means comprising a cartridge holder fixedly attached to said blower means, one end of said holder comprising fluid pickup means comprising a pickup conduit, one end of said pickup conduit comprising a pickup chute disposed in fluid-receiving relation to said portion of said fluid, and adjustable volume control means operatively disposed in said pickup conduit downstream of said pickup chute whereby the volume of said portion of said fluid may be adjusted within predetermined parameters; the other end of said holder including a delivery conduit delivering to



the main flow of fluid and cartridge means removably attachable to said receiver means, said cartridge means comprising a solid material placed therein, whereby said portion of said fluid will pass through said cartridge means so as to mix and dispense said solid material with the main flow of the fluid exhaust from said blower means.

4,256,242
DISPENSER HAVING A ROLLER FOR SQUEEZING AMOUNTS FROM A TUBE
William C. Christine, 341 St. John St., Catasauqua, Pa. 18032
Filed Oct. 23, 1979, Ser. No. 87,478
Int. Cl.[3] G01F *11/02*
U.S. Cl. 222—207 **3 Claims**



1. In a dispenser, a housing comprising a base portion having a back wall, spaced parallel side walls, a bottom portion having a slot therein, said housing further embodying a top portion, a cover hingedly connected at its top to said base portion, said cover including a front wall section, inclined bottom and top wall sections, and spaced parallel side wall sections, hinge means and latch means for said cover, a service unit removably mounted in said housing for holding material to be dispensed, said service unit including a collapsable body portion, a rigid end piece affixed to said body portion, a spout on said end piece, a removable elastomeric dispenser tube having an end connected to said spout, said tube having its lower end projecting through the slot in the bottom portion of said housing, said tube having memory, bracket members mounted in the cover portion of the said housing, a pivot pin extending between said bracket members, spring means mounted on said pivot pin, bars pivotally mounted on said pin, a shaft connected to said bars, a roller mounted on said shaft, said roller selectively engaging

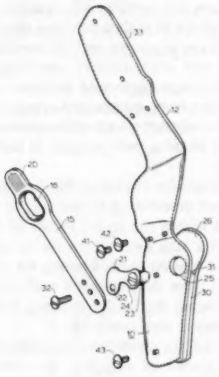
said tube, a stop member for limiting movement of said roller, an operating lever including a support portion and a curved end portion that defines a clip for selectively engaging said tube, and said operating lever further including a projecting end to be conveniently gripped by the user's fingers, ears affixed to said lever, and said ears having apertures therein, a pivot pin extending through apertures in the ears, and a check valve mounted in an end of tube.

4,256,243

HOLSTER WITH HESITATION LOCK

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.

Filed Feb. 12, 1979, Ser. No. 11,420
Int. Cl.[3] F41C *33/02*
U.S. Cl. 224—244 **12 Claims**



1. A holster with a hesitation lock comprising a holster body and means for securing the holster to a user's belt;

said holster body defining a pocket for holding a handgun and including a region of the body thereof which encloses the trigger guard of a handgun when positioned in the holster;

said holster body further including a stop for engaging and limiting the extent of inward movement of the trigger guard within said pocket;

elongated spring means secured to said holster body at one end in the general region of the muzzle of the weapon and having the opposite end unrestrained;

means engaging the unrestrained end of said spring means protruding into the trigger guard of a hand gun when positioned in the holster against said stop;

said stop is so positioned in said holster and cooperating with said spring means having insufficient length to allow said protuberance means to engage a trigger when the hand gun is fully bottomed out within the holster against said stop;

said spring means having sufficient resistance to bending to prevent the weight of the weapon when the holster is inverted from deflecting the spring and allowing the weapon to fall;

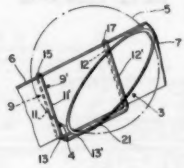
said spring having a resistance to deflection insufficient to prevent the withdrawal of the hand gun by drawing pressure applied to the grip of the handgun.

4,256,244

CLIP-ON BALL HOLDER

Ronald S. Gasper, 8701 Eaglebrook Ct., Alexandria, Va. 22308

Filed May 9, 1980, Ser. No. 148,149
Int. Cl.[3] A41F *9/00*
U.S. Cl. 224—252 **8 Claims**



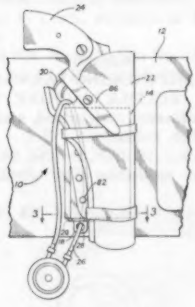
1. A ball holder comprising a single resilient ring having an internal diameter slightly less than the external diameter of the ball to be held and a clap means comprising a pair of substantially U-shaped members integrally joined at their top extremities to form a clip for engaging a planar substrate, said ring being attached to a center portion of the base of one of said substantially U-shaped members in a manner whereby said ring diverges outwardly from the point of attachment, the plane of said ring forming an acute angle with the plane of said substantially U-shaped member so as to permit insertion of a ball between said ring and said U-shaped member and to provide flexure of the ring away from said U-shaped member when a ball is inserted, the flexure of said ring providing sufficient biasing force to hold the ball between said ring and said U-shaped member.

4,256,245

GUN-MOUNTING APPARATUS

Paul J. Serres, 11283 Serres La., Woodburn, Oreg. 97071

Filed Oct. 26, 1979, Ser. No. 88,543
Int. Cl.[3] F41C *33/00*
U.S. Cl. 224—273 **4 Claims**



1. Apparatus for mounting a hand gun on a vehicle, said apparatus comprising

a mounting bracket adapted to be permanently secured to the vehicle,

a holster bracket carrying thereon a holster adapted to receive a hand gun,

one of said brackets having a projection, the other of said brackets having a slot,

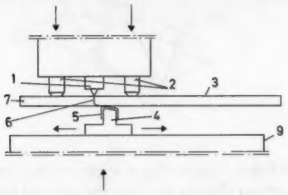
interlocking means on said brackets for detachably mounting said holster bracket on said mounting bracket, wherein said projection is received in said slot, and

means enabling locking of said projection, with such received in said slot.

4,256,246
DEVICE FOR BREAKING A GLASS PLATE SO AS TO OBTAIN A SHARP EDGE

Erik L. Kindel, Älvsjö, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Jun. 26, 1979, Ser. No. 52,101
Claims priority, application Sweden, Jul. 4, 1978, 7807502
Int. Cl.[3] C03B *33/02*
U.S. Cl. 225—103 6 Claims



1. A breaking rule to be arranged on one side of a glass plate for breaking the plate to make a glass knife as a result of force applied by a least two spaced breaking knobs moving in a perpendicular direction against the opposite side of the glass plate, the knobs being disposed on opposite sides of a straight line scribed in the surface of the opposite side of the plate, characterized in that the breaking rule comprises:

a flat base to be displaceably supported on a flat surface parallel with respect to the glass plate;

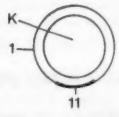
said base including a medially located portion projecting outwardly toward said one side of the glass plate and having a narrow surface elongated in a direction parallel with said scribed line and facing said one side of the plate for contact therewith;

said base being movable along said flat surface in a path at right angles to said scribed line to vary the edge angles to the resulting knife in accordance with the displacement of the location of contact between said narrow surface and said scribed line.

4,256,247
DEVICE FOR MONITORING YARN MOTION ON A TEXTILE MACHINE

Erich Loepfe, Pfaffhausen, Switzerland, assignor to Gebrüder Loepfe AG, Zurich, Switzerland

Filed Sep. 18, 1978, Ser. No. 943,526
Claims priority, application Switzerland, Oct. 5, 1977, 12160/77
Int. Cl.[3] B65H *63/02;* G01R *29/12*
U.S. Cl. 226—45 8 Claims

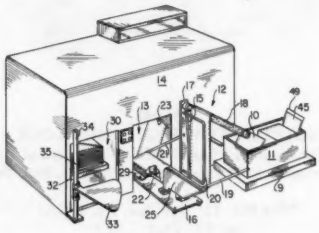


1. A sensing device responsive to ballooning motion of a yarn travelling on a textile machine, comprising a yarn guide structure forming a yarn channel surrounding the travelling yarn, yarn motion responsive electrode means and means non-responsive to yarn motion arranged in alternate sequence at said yarn guide structure in circumferential direction of the yarn channel, and said yarn motion responsive electrode means generating an electrical signal when acted upon by the travelling yarn.

4,256,248
APPARATUS AND METHOD FOR FEEDING AND COLLECTING CONTINUOUS WEB MATERIAL

James F. Lapp, Glen Ellyn, and Thomas F. McGrath, Tinley Park, both of Ill., assignors to Acme Visible Records, Inc., Crozet, Va.

Filed Nov. 2, 1979, Ser. No. 90,585
Int. Cl.[3] B65H *17/42*
U.S. Cl. 226—118 6 Claims



1. An apparatus for continuously feeding a series of web portions to a high speed web processing machine having web intake and discharge apertures each located in a recessed area of the machine and intermittently removing processed web portions in stacked form from said machine without requiring the web processing to be interrupted comprising

(a) web portion alignment and splicing means exterior of the machine for aligning web portions in tandem relationship for splicing;

(b) turn bar means for changing the direction of web travel from the path determined by splicing to successive paths toward and within the intake recess of the machine and thereafter in a path through the intake aperture;

(c) driving and tension control means for controllably driving the web from the alignment and splicing means to a position adjacent the intake aperture which driving and control means in turn comprise

(i) a driven roll for contacting the web, said roll having a surface capable of engaging the web with sufficient force to substantially assist in pulling the web from the alignment and splicing means to a position adjacent the intake aperture with the remainder of the force required for web movement being supplied by an internal web moving means located within said web processing machine; and

(ii) drive means for driving the driven roll;

(d) movable stack support means positioned adjacent said web processing machine which support means is readily movable into the discharge web stack to support an upper portion of the stack permitting removal of a lower portion of stack and said support means being movable out of the stack to allow the upper portion to move down into space left by the removed stack portion.

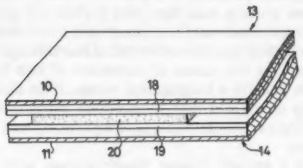
4,256,249
PHOTOGRAPHING FILM CONVEYING DEVICE

Takeshi Konno; Masaharu Inaba, and Takayuki Inayama, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 5, 1979, Ser. No. 1,086
Claims priority, application Japan, Jan. 10, 1978, 53-1357[U]
Int. Cl.[3] B65H *17/22*
U.S. Cl. 226—181 2 Claims

1. A photographing film conveying device of the type

wherein a photographic film is held between a pair of conveyor belts of insulating material, characterized in that each of



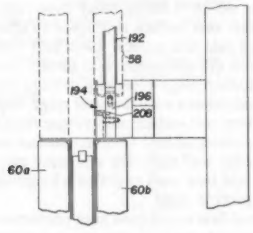
said belts is provided with at least one electrical conductive layer whose surface resistivity is less than 10^9 ohms.

4,256,250

METHOD AND APPARATUS FOR SETTING FASTENER ELEMENTS INTO A BLANK

Conrad LeBlanc, Montreal, Canada, assignor to DRG Limited, Ontario, Canada

Filed Nov. 14, 1978, Ser. No. 960,655
Claims priority, application Canada, Nov. 30, 1977, 292095
Int. Cl.³ A41H *39/04*
U.S. Cl. 227—17 **18 Claims**



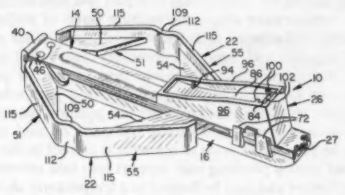
1. Apparatus for setting a fastener element, such as an eyelet or a tang, in a blank, comprising means defining a path of travel for the blank, a fastener element setting station in said path of travel including a plurality of rotary die holder means mounted for rotation about a pair of spaced generally parallel axes and defining a nip therebetween for receiving a portion of the blank, a plurality of circumferentially spaced apart fastener element setting dies carried by each of the die holder means for rotation therewith in such a way that, upon rotation of the die holder means about their respective spaced axes, successive pairs of said fastener element setting dies come into opposing relationship with one another in the nip, means for advancing the blank edgewise along the path of travel in timed relation to the rotation of the die holder means to bring said portion of the blank into the nip, means for feeding fastener elements to the setting dies in such a way that each fastener element is carried into a position in the nip between a respective opposing pair of said setting dies along with a portion of the blank, and means for momentarily applying fastener element setting forces during the rotation of the rotary die holder means which forces act through each said opposing pair of setting dies while they are in the nip to set the respective fastener elements positioned therebetween, whereby, upon application of the momentary fastener element setting forces individual fasteners are successively set into said portion of the blank.

4,256,251

SURGICAL STAPLERS AND STAPLE

Jerome F. Moshofsky, Portland, Oreg., assignor to Lawrence M. Smith, Lake Oswego, Oreg.

Continuation-in-part of Ser. No. 899,350, Apr. 24, 1978, abandoned. This application Apr. 3, 1979, Ser. No. 26,071
Int. Cl.³ B25C *5/04, 5/11;* A61B *17/12*
U.S. Cl. 227—120 **19 Claims**



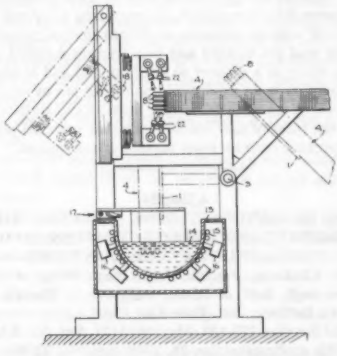
1. In a surgical stapler,
a channel-like base,
a corner having a staple opening therethrough,
the cover and the base having a ram guiding portion and a staple guiding portion and also being provided with an anvil,
magazine means secured to the base and the cover in alignment with the opening for urging a stack of staples through the opening to position an end staple in the staple guiding portion, the magazine means being snap-fastened and interlocked to the base with the cover secured therebetween,
a ram slidable along the ram guiding portion and the staple guiding portion to move the end staple to the anvil and bend the staple around the anvil,
and means for driving the ram in response to a squeezing motion applied laterally in the plane of movement of the ram.

4,256,252

SOLDERING APPARATUS

Robert D. Huppunen, Cos Cob, and Robert R. Harriau, Old Greenwich, both of Conn., assignors to Thermatool Corp., Stamford, Conn.

Filed Feb. 26, 1979, Ser. No. 14,858
Int. Cl.³ B23K *1/08, 1/06*
U.S. Cl. 228—1 A **9 Claims**



1. Apparatus for soldering a first part to a second part comprising:
a support having an upper surface for receiving said first part and said second part with portions thereof in engaged

relation and which is mounted for pivotal movement around a horizontal axis, said support being pivotable from a first position in which said surface is generally horizontal to a second position at one side of said axis in which said surface is at an angle to the horizontal;

a solder pot for containing molten solder, said pot being disposed to surround said engaged portions of said first part and said second part with molten solder when said support is in said second postion;

heating means for heating said first part and said second part to a temperature above the melting point of solder, said heating means being mounted adjacent said solder pot and said support and being mounted for movement toward and away from said pivotable support into a position adjacent said first part and said second part when the support, and hence the parts, are in a position spaced from said second position, whereby the parts on said support may be pre-heated prior to immersion thereof in the solder in said pot by pivoting said support into said second position thereof and may be heated to a temperature above the melting point of solder after the parts are removed from the solder in the pot by pivoting said support away from said second position and toward said first position; and

means for pivoting said support and for moving said heating means.

4,256,253

FRICTION PRESSURE WELDING METHOD

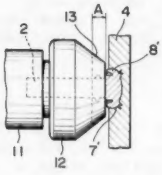
Takeshi Nishiwaki, Satte, Japan, assignor to Akebono Brake Industry Company, Ltd, Tokyo, Japan

Filed Jun. 21, 1979, Ser. No. 50,633

Claims priority, application Japan, Jun. 28, 1978, 53-78320

Int. Cl.³ B23K *19/02*

U.S. Cl. 228—112 **2 Claims**



1. A friction pressure welding method comprising: clamping a pillar-shaped pin in a collet chuck of a friction pressure welding machine, providing a member to be welded to said pin, said member having a recess with an inner diameter larger than an outer diameter of said pin, providing a cap nut on said collet chuck with an extension at a front thereof, rotating and advancing said pin toward and into friction welding contact with said recess in a manner so as to control and to check the flash projection in an axial direction of the pin by engaging a curl portion of the flash projecting from an end surface of said pin with the front of said cap nut such that said curl portion is forcibly pressed onto an inner surface of said recess.

4,256,254

METHOD OF MANUFACTURING A WELDED JOINT IN SEGMENTED SHEATH FOR COMPRESSED GAS INSULATED TRANSMISSION LINES

Alan H. Cookson, Southborough, and Philip C. Bolin, Northborough, both of Mass., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 779,124, Mar. 18, 1977, Pat. No. 4,164,243. This application Apr. 25, 1979, Ser. No. 32,983

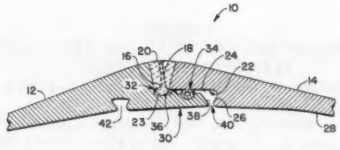
Int. Cl.³ B23K *31/06*

U.S. Cl. 228—166 **2 Claims**

1. A method for joining longitudinal sections of an arcuate segmented sheath of a compressed gas insulated transmission line having an interior wall relative to a longitudinal axis at the center of curvature of said segmented sheath and an exterior wall relative to said longitudinal axis and to said interior wall, said method comprising the steps of:

extruding a first arcuate sheath section with a first longitudinal joint portion, said first joint portion comprising (a) a first longitudinal margin adjacent said outer wall having a face generally parallel with a radial line through a longitudinal axis at the center of curvature of said first sheath section, and (b) a longitudinal recess offset from and extending along said first longitudinal margin, said recess including a circumferential base wall facing said longitudinal axis;

extruding a second arcuate sheath section with a second longitudinal joint portion, said second longitudinal joint portion comprising (a) a second longitudinal margin adjacent said exterior wall of said second section having a face generally parallel with a radial line through a longitudinal axis at the center of curvature of said second sheath section, said second margin being adapted to abut to said first margin when said first and second joint portions are assembled, (b) a tongue extending circumferentially from



said second section adjacent said interior wall and having one surface which is facing away from said longitudinal axis such that said surface is adapted to confront to said base wall of said first section when said first and second joint portions are assembled, said surface having thereon (c) a longitudinal ridge extending radially and away from said longitudinal axis such that said ridge may abut to said base wall from said surface, said tongue further having (d) a terminal portion tapered from said surface to said second section interior wall such that said taper may overhang a portion of said base wall to define a longitudinal channel forming a particle trap;

juxtaposing said first and second joint portions such that said first and second margins abut to one another and said circumferential wall rests on said ridge with said terminal portion overhanging a portion of said base wall thereby defining a particle trap, said joint being substantially in the form of an overlap joint; and

interposing a sealing means intermediate said tongue and said recess;

butt welding said first and second margins to full penetration to form a seal-welded seam.

4,256,255

METHOD OF BRAZING WITH REPLACED BRAZE POWDER

David R. Stevenson, Linwood, Scotland, assignor to Rolls-Royce Limited, London, England

Division of Ser. No. 8,687, Jan. 30, 1979, abandoned. This application Nov. 23, 1979, Ser. No. 96,849

Claims priority, application United Kingdom, Feb. 14, 1978, 5785/78

Int. Cl.³ B23K *1/04*

U.S. Cl. 228—175 **1 Claim**

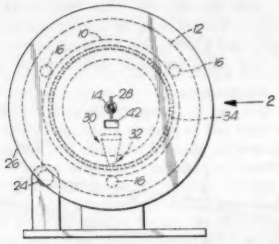
1. A method of brazing an arcuate honeycomb structure to the wall of a bore in a workpiece, said method comprising the successive steps of:

(1) tack welding the arcuate honeycomb structure to the workpiece wall;

(2) rotating the workpiece and honeycomb structure about

the axis of the bore while concurrently applying metallic braze powder to the rotating honeycomb structure and, in turn, the wall of the bore, the thus applied metallic braze powder retained in the rotating workpiece by centrifugal force;

(3) continuing to rotate the workpiece until a predetermined amount of metallic braze powder is applied;



(4) applying a liquid binder to the thus applied metallic braze powder through the honeycomb structure while continuing to rotate the workpiece;

(5) continuing rotation of the workpiece and allowing the thus applied liquid binder to dry retaining the applied metallic braze powder;

(6) discontinuing rotation of the workpiece; and

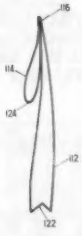
(7) brazing the resulting assembly.

4,256,256

MULTIPLE COMPARTMENT POUCH AND METHOD OF MAKING SAME

George L. Meyers, Ashland, Ohio, assignor to American Can Company, Greenwich, Conn.

Filed Apr. 30, 1979, Ser. No. 34,724
Int. Cl.³ B65D *30/22*
U.S. Cl. 229—56 **1 Claim**



1. A pouch for use in packaging food or similar material comprising:

(a) a first pouch formed of a single folded-over sheet of flexible sheet material with the fold defining the bottom of the pouch, said first pouch having inner and outer surfaces and front and rear faces, the sheet material of the first pouch having a first pre-selected level of protective ability and being a laminate of paper and thermoplastic material with the thermoplastic material positioned on the inside of the pouch, the first pouch being sealed at its top and side edges;

(b) a second pouch positioned adjacent to the first pouch and formed of a single folded-over sheet of flexible sheet material with the fold defining the bottom of the pouch, the sheet material of the second pouch having a second pre-selected level of protective ability and being a laminate of paper, metal and thermoplastic material, the second pouch also being sealed at its top and side edges; and

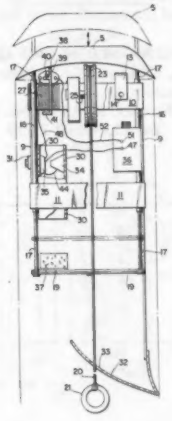
(c) the sealed top edges of the first and second pouches being positioned together and sealed to each other to form a single dual compartment pouch, the sheet of material of the first pouch being folded over slightly off of its centerline so that one of the faces of the first pouch is longer than the other so that the inner surface of the longer face of the first pouch is brought into contact with the second pouch and sealed thereto to attach the second pouch to the first pouch.

4,256,257

AUTOMATIC CHIMNEY CAP

Carl A. Pinkerton, 6093 Northgap Rd., Columbus, Ohio 43229

Filed Jul. 2, 1979, Ser. No. 54,179
Int. Cl.³ G05D *23/00*; F23L *11/00, 17/02*
U.S. Cl. 236—1 G **17 Claims**



1. An automatic chimney closure cap for use in sealing the upper end of a chimney having a vertically extending smoke passage leading from a combustion area that when operating will produce hot combustion gases to an upper terminal discharge end, comprising:

a rigid frame of a size and shape to fit telescopically within the chimney upper end, and having securement means for rigidly fixing the frame to the chimney;

a generally impervious movable valve member mounted for movement relative to said frame so as to be movable from a first position sealing the terminal discharge end of said chimney to prevent the movement of air into and out of said chimney through said terminal discharge end, and a second position spaced from said first position to vent the terminal discharge end of said chimney to provide for the exhaust of the combustion gases from the combustion area;

an electrical motor means mounted on said frame, having a control signal input for selected actuation and a power output;

power transmission linkage means between said motor power output and said movable valve member so that actuation of said motor will move said movable valve member from one of its said positions to the other of its said positions;

detector means mounted on said frame within said chimney between said combustion area and said movable valve member for detecting smoke or incipient particles of combustion gases and producing a correlated detection signal when such exceed a fixed reference level;

power means responsive to a control signal for moving said movable valve member from said other position to said one position;

control means responsive to said detector signal to produce a control signal for actuation of one of said power means and said motor means to move said movable valve member from its sealed first position to its vent second position;

shield means mounted on said frame for movement from a detect position spaced from said detector means that permits smoke and heat from the combustion gases rising in said chimney to reach said detector means and a second shield position at least partially enveloping said detector means and shielding said detector means from heat and smoke passing through said chimney; and

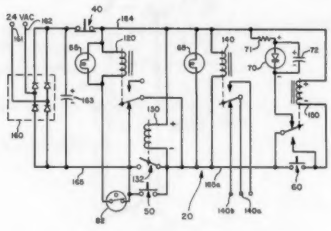
means interconnecting said shield means with said movable valve member so that said shield means will be in its shield position when said movable valve member is in its vent second position and said shield means will be in its detect position when said movable valve is in its sealed first position.

4,256,258

TEMPERATURE MONITOR AND ALARM SYSTEM

George W. Sekiya, Chicago, Ill., assignor to Mark Controls Corporation, Evanston, Ill.

Filed Nov. 19, 1979, Ser. No. 95,231
Int. Cl.³ G05D *23/19*
U.S. Cl. 236—94 **8 Claims**



4. A temperature monitoring and alarm circuit for a source of fluid, said circuit powered by a voltage source having first and second terminals, said circuit comprising:

a first conductor;

means for connecting the first conductor to the first terminal;

a second conductor;

means for connecting the second conductor to the second terminal;

a third conductor;

alarm means connected between the first and third conductors;

sensor means, responsive to the temperature of said source, for providing an indication when the temperature of said source is outside of a selected temperature range;

switch means, responsive to the sensor means, for interconnecting said second and third conductors when sensor means provides said indication; and

latch means, responsive to a momentary interconnection between said second and third conductors, for maintaining said second and third conductors in electrical contact once said switch means has interconnected said second and third conductors.

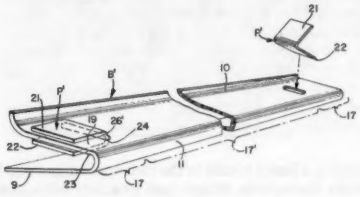
4,256,259

INSULATED RAIL JOINT

William C. Gore, Elgin, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed May 30, 1978, Ser. No. 910,875
Int. Cl.³ E01B *11/54, 11/10*
U.S. Cl. 238—160 **1 Claim**

1. An insulated rail joint including, an adjacent pair of rail sections each having a pair of base flanges, a unitary separate metal joint bar having a head and including a foot provided with opposite end faces disposed adjacent both said rail base flanges on each side of said rail sections, said joint bar including an integral base beneath and spaced from said foot, an insulative base piece intermediate each said joint bar foot and adjacent pair of rail base flanges and having a top surface, each said base piece including a central section entirely disposed between said joint bar and adjacent rail base flanges and bounded by a pair of integral terminal sections projecting beyond said joint bar foot end faces respectively, said insulative base piece provided with an uppper arm having said top surface thereon and a lower arm disposed intermediate said rail base flange and joint bar base, said terminal sections each



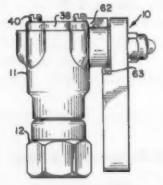
having an enclosed opening through said upper arm provided with a periphery adjacent both said central section and an end face of said joint bar foot, an end abutment member comprising a separate element attached to each said terminal section through said opening, each said end abutment member comprising a unitary U-shaped clip disposed through one said opening and having a top wall elevated above and overlying one said terminal section upper arm and a connected bottom wall underlying said same terminal section upper arm, and each said end abutment member including an inner abutment surface juxtaposed one said joint bar foot end face whereby, relative longitudinal displacement in either direction between said base piece and joint bar is precluded.

4,256,260

SPRAY HEAD

Richard G. Piggott, 936 Marshall Ave., Bellwood, Ill. 60104

Filed Apr. 23, 1979, Ser. No. 25,184
Int. Cl.³ B05B *15/02*
U.S. Cl. 239—119 **7 Claims**



1. A nozzle assembly for spraying a fluid material which comprises a tubular body having a coupling at one end for attachment to a fluid material supply means, said body having an axial bore which is divided into sections of different cross sectional diameter, a section of large diameter being at the discharge end of the bore which is remote from the coupling and which forms a chamber for receiving a generally spherical spray tip holder and associated bearing forming means for mounting said tip holder for rotation therein, said tip holder having a diametrical bore with an enlarged portion at one end forming a recess for seating therein a spray tip, a readily removable cap mounted on the discharge forming end of said axial bore for retaining said tip holder in said chamber, said cap having a center spray discharge opening of smaller diameter than the diameter of the tip holder and having a narrow inner

annular face mating with the curved surface of the tip holder so as to form a bearing for the tip holder, and an inner bearing and sealing assembly in said chamber for cooperation with said cap in supporting said tip holder so that it may be rotated between a spraying position where the bore thereof is axially aligned with the bore in the body to permit passage of the fluid material for spraying and another position where the flow of the fluid material is in the opposite direction through the tip for clearing the tip, said inner bearing and sealing assembly comprising a bearing member with a relatively small axial bore, positioned with a cup shaped end, disposed in said end chamber and forming a seat for said tip holder with bearing and sealing areas mating with the curved surface of said tip holder and a stem forming end portion of substantially lesser cross sectional diameter than the diameter of said cup shaped end portion and extending into a section of the bore of the body which adjoins said end chamber forming section and which is of substantially lesser diameter than said end chamber, said cup shaped portion of said bearing member having an outside diameter substantially greater than the outside diameter of said stem portion with an axially facing shoulder formation between said portions and a sealing gasket between said shoulder formation and an internal confronting shoulder formation separating said body end chamber forming bore section and the adjoining section of the bore of the nozzle body into which said stem portion extends which sealing gasket is precompressed when installed so as to hold the inner and outer bearing surfaces in engagement with the mating surface of said tip holder, said stem portion having an outside diameter somewhat smaller than the diameter of the body bore section into which it extends and a seal forming element of resilient material associated with said stem portion for sealing between an outside face of said stem portion and the confronting inside face of said lesser diameter bore section and arranged so as to permit a minimum of force in an axial direction on the bearing member by the fluid material.

4,256,261

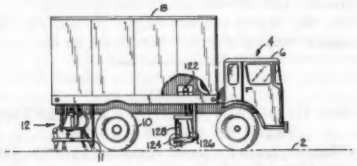
HIGHWAY STRIPING METHOD AND APPARATUS

Richard S. Gurney, Roseville, Minn., assignor to H. B. Fuller Company, Saint Paul, Minn.

Continuation of Ser. No. 832,642, Sep. 12, 1977, abandoned. This application Nov. 29, 1979, Ser. No. 98,526

Int. Cl.³ B05B *15/10, 15/02*

U.S. Cl. 239—155 **5 Claims**



1. An apparatus suitable for applying a curable coating composition having first and second components to a first longitudinally extending portion of a paved surface, comprising a movable vehicle suitable for traveling over the paved surface; cleaning means carried by said vehicle for cleaning the first portion of the paved surface, said cleaning means including a first nozzle for applying a water spray to the first portion, and a second nozzle for applying an air blast to the first portion, said first and second nozzles being sequentially operative to wet the first portion and then at least partially blow the water applied to the first portion to the sides thereof prior to the coating of the first portion of the paved surface; a third nozzle carried by said vehicle for applying a pressurized flow of the coating composition to the first portion of the paved surface after the cleaning thereof; and means responsive to the movement of said vehicle for controlling the operation of said first, second and third nozzles to coat the first portion of the paved surface as said vehicle moves thereover, wherein said first, second and third nozzles are carried by a wheeled carriage attached to said vehicle and positioned over the first portion of the paved surface, said carriage being movable vertically relative to said vehicle between a first position where said carriage engages the paved surface and a second position where said carriage is held out of engagement with the paved surface, wherein said carriage comprises a support frame pivotable about a first axis located on said vehicle and a support plate pivotable about a second axis located on said support frame, and further including means attached to the vehicle for respectively pivotting said support frame and support plate about their respective axes.

4,256,262

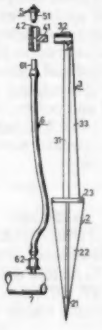
MOUNTING FOR WATER IRRIGATION DEVICE

Peretz Rosenberg, and Avner Rosenberg, both of Moshav Beit Shearim, Israel

Filed Oct. 24, 1979, Ser. No. 88,072

Int. Cl.³ A62C *31/22*

U.S. Cl. 239—276 **9 Claims**



1. A mounting for a water irrigation device, comprising: a ground stake adapted to be inserted into the ground; a vertical post carried at one end said ground stake to extend in a vertical direction when the ground stake is inseted into the ground; a cylindrical horizontal socket carried at the opposite end of said vertical post and having a longitudinal axis disposed at right angles to the longitudinal axis of the post so as to extend in the horizontal direction at the upper end of the vertical post when the ground stake is inserted into the ground; a fitting having a laterally-extending cylindrical stem frictionally receivable in said socket and permitting manual rotation of the fitting about said longitudinal axis of the socket; a cavity formed in the upper end of said fitting for receiving the water irrigation device; and a flexible tube having a first connector at one end for attachment to a water supply pipe, and a second connector at the opposite end for attachment to the fitting to supply water to the water irrigation device when received in the said cavity.

4,256,263

SPRAY NOZZLE FOR SHOWER APPARATUS

Peter T. Green, and Nicholas J. Beck, both of Teukesbury, England, assignors to Walker Crosweller & Company Limited, Gloucestershire, England

Continuation of Ser. No. 907,031, May 17, 1978, abandoned. This application Jan. 18, 1980, Ser. No. 113,227

Int. Cl.³ B05B *1/34*

U.S. Cl. 239—487 **8 Claims**

1. A spray nozzle for shower-bathing apparatus comprising:

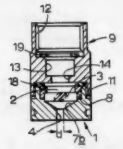
a body having a duct extending from an inlet to the outlet for the passage of water therethrough; and

means in association with said body for producing a full cone water spray of circular pattern, said means including

walls of right cylindrical configuration in said body to form a single outlet orifice for said outlet, said orifice having a diameter "d",

a chamber in said duct positioned between said inlet and said outlet,

swirl means fixedly housed in said chamber for imparting a swirling motion to the water and comprising a guide member having a plurality of fixed guide vanes, said guide vanes extending radially in the same plane from a central, generally cylindrical hub having a diameter "h" and having substantially flat guide faces angled relative to the hub axis, such that said guide vanes and said chamber wall define generally triangular shaped apertures each having a cross-sectional area as great as the cross-sectional area of said nozzle orifice and said chamber having a converging guide wall on the downstream side of the swirl means leading directly to said orifice; and wherein the ratio of d:h is between 0.55 and 0.7 inclusive so as to achieve a full cone water spray of circular pattern over a large range of pressures when in use.



4,256,264

TUBE MILL

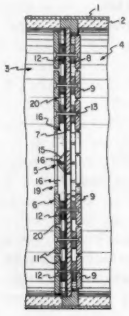
Ib Hansen, and Hans Gommesen, both of Copenhagen, Denmark, assignors to F. L. Smidth & Co., Cresskill, N.J.

Filed Feb. 27, 1979, Ser. No. 15,745

Claims priority, application United Kingdom, Feb. 27, 1978, 7674/78

Int. Cl.³ B02C *17/07*

U.S. Cl. 241—72 **28 Claims**



1. A tube mill for grinding material which comprises at least one grinding chamber having an upstream and a downstream end, a diaphragm positioned within the downstream end portion of said grinding chamber, said diaphragm having a relatively coarse grate facing said grinding chamber for retaining grinding bodies in said chamber, said grate having a plurality of relatively coarse openings for the passage of relatively coarse material therethrough, said openings constituting substantially the effective open area of said grate, said grate being formed by a plurality of wear plates dimensioned and positioned so as to create said openings between adjacent wear plates, a sieving screen positioned downstream of said grate so as to define a space therebetween, said screen defining a plurality of openings dimensioned less than the openings defined by said grate for sieving the ground material passing through said grate, a plurality of guide members disposed within the space defined by said grate and said screen to guide relatively coarse material not passing through said screen in a direction toward said upstream end so as to pass through said grate to said grinding chamber for further grinding.

4,256,265

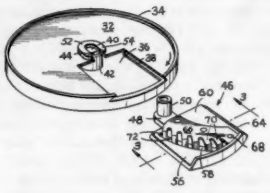
ROTARY CUTTER BLADE

Bhim S. Madan, Brockport, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Sep. 6, 1979, Ser. No. 72,983

Int. Cl.³ B02C *18/18*; A47J *44/00*

U.S. Cl. 241—92 **4 Claims**



1. In a food processor cutter blade on a disc rotated by a shaft centrally thereof, the disc having a single rectangular locking-edged opening therethrough on one side only of the disc center and terminating short thereof, a narrow slot centrally of the opening and extending across the disc center, the disc having a depending central hub crossing said slot to receive the shaft therethrough, an improvement comprising,

a removable locking-edged insert having a tab radially and frictionally slidable into said opening over the hub to totally support the disc,

the insert having a first coplanar-with-the disc surface,

a resting surface contiguous with and depressed below said first surface,

a second surface above and spaced from said surfaces by an elongated stepped opening facing the direction of disc rotation and scooped toward the disc surface,

a cutter blade secured to said second surface and having a plurality of cantilever spaced fingers each bent to contact the resting surface with facing cutting edges,

whereby the fingers are end-supported and cut adjacent elongated strips and direct them down on disc rotation.

4,256,266

PROCESS TO OBTAIN ANATHASE CONCENTRATES FROM AN ANATHASE ORE

Gustavo Magalhaes, rua Professor Almeida Cunha No. 196, Belo Horizonte Minas Gerais, Brazil

Filed Dec. 20, 1978, Ser. No. 971,266

Claims priority, application Brazil, Jan. 31, 1978, 7800585

Int. Cl.³ B02C *23/20*

U.S. Cl. 241—20 **1 Claim**

1. A process for treating raw anathase ore to obtain an anathase concentrate containing a reduced content of non-titanium impurities suitable for utilization in the chlorine process for producing high grade titanium compound pigments and metallic titanium consisting essentially of the steps of:

(a) grinding the raw anathase ore to particles having a diameter less than 125 mm;

(b) disaggregating the ground ore in water;

(c) classifying the disaggregated ore in aqueous suspension to produce a de-slimed, coarse fraction and a slimes fraction;

(d) grinding the de-slimed, coarse fraction to particles having a diameter less than 3 mm;

(e) subjecting the ground fraction to low intensity magnetic

separation to produce a magnetic and a non-magnetic fraction;

(f) grinding the non-magnetic fraction to particles having an average size between 32 mesh and 200 mesh;

(g) drying and calcining the ground, non-magnetic fraction under conditions such that the limonite and hematite content thereof are converted and reduced to magnetite;

(h) subjecting the calcined fraction to low intensity magnetic separation to remove said magnetite;

(i) subjecting the said calcined fraction from which magnetite has been removed to electrostatic separation to yield a conductive fraction rich in anathase and low in non-titanium impurity content.

4,256,267

RECOVERY OF MINERALS FROM ULTRA-BASIC ROCKS

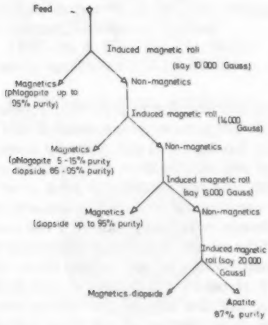
Phillip F. Burton, Phalaborwa, South Africa, and Risto T. Hukki, Otaniemi, Finland, assignors to Foskem (Proprietary) Limited of "Wegsteek", Phalaborwa, South Africa

Filed Dec. 6, 1978, Ser. No. 966,886

Claims priority, application South Africa, Dec. 13, 1977, 77/7409; Nov. 17, 1978, 78/6464

Int. Cl.³ B07B *15/00*

U.S. Cl. 241—24 **48 Claims**



1. A process for the metallurgical treatment of apatite ore, which comprises subjecting a pyroxenite type ore in comminuted form and predominantly composed of articles in the size range of about 40 to 600 micron, as determined by screen analysis, to dry high intensity magnetic separation to recover a non-attracted fraction composed essentially of an apatite concentrate separated from silicate minerals of the pyroxenite ore as attracted fractions.

23. A process as claimed in claim **1**, including the step of subjecting the ore to dry autogenous or semi-autogenous milling to obtain the desired degree of comminution.

4,256,268

COIL WINDING MACHINE TO WIND SADDLE-SHAPED COILS

Rudolf Fahrbach, Branchville, N.J., assignor to Universal Manufacturing Co., Inc., Irvington, N.J.

Filed Feb. 15, 1979, Ser. No. 12,297

Int. Cl.³ H01F *41/06*; B21C *47/02*; B65H *81/00*

U.S. Cl. 242—7.11 **11 Claims**

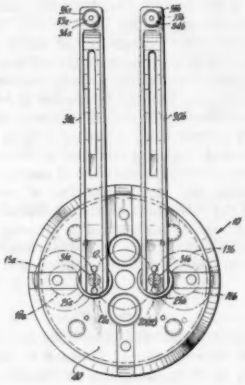
1. A machine for winding a coil onto a mandrel with at least two wires, said machine including a base, motor means mounted on said base, means to hold a single mandrel which is wound with the said two wires, and a winding head mounted on said base and driven by said motor means, said winding head including:

a housing attached to said base;

a first and a second wire feed means each rotatively mounted in said housing and each adapted to feed one of said wires therethrough;

a first and a second flyer arm connected respectively to said first and second wire feed means, said flyer arms having portions thereof of sufficient lengths so that their circles of rotation intersect;

means for mounting each of said flyer arms on said housing, said mounting means mounting said flyer arms for rotation with the circle of rotation of one flyer arm intersecting the circle of rotation of the other flyer arm if rotation occurred in the same plane;



a first and a second flyer wire guide means respectively carried by said first and second flyer arms to guide their respective wires onto said mandrel;

flyer arm rotation means driven by said motor means to rotate each of said flyer arms; and

flyer arm reciprocating means to axially reciprocate each of said flyer arms at times simultaneously with their rotation and along their axis of rotation, said reciprocation of said flyer arms being simultaneously at times in opposite axial directions and never simultaneously in the same direction, so that the flyer arms do not collide in their rotation although they would collide if they were in the same plane.

4,256,269

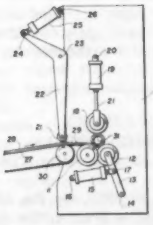
CARPET ROLL FORMING APPARATUS AND METHOD

James M. Feighery, and Dwight E. Howden, both of Dalton, Ga., assignors to Tex-Del, Inc., Dalton, Ga.

Filed Dec. 28, 1978, Ser. No. 973,960

Int. Cl.³ B65H *17/12*

U.S. Cl. 242—66 **11 Claims**



1. A method of forming a firm substantially cylindrical substantially non-sagging roll from a web of soft bulky material comprising the steps of positioning one end of the web at a roll forming station and initiating the formation of a roll from said web at said station, frictionally rotationally engaging said roll

undergoing formation at three circumferentially spaced parallel lines of contact along the length of the roll undergoing formation with two of the lines of contact initially closely spaced apart near the bottom of the roll and the third line of contact located near the top of the roll and between the bottom lines of contact, frictionally driving said roll undergoing formation in the same direction at all three lines of contact and at a somewhat greater rotational speed at the top line of contact than at the bottom two lines of contact with said roll, continuing to maintain said three parallel lines of contact with said roll during the growth of the roll in diameter while the roll is rotating and allowing the top line of contact with the roll to rise relative to the bottom two lines of contact during said growth, gradually separating one of said bottom lines of contact from the other bottom line of contact with said roll following the growth in diameter of the roll to a predetermined degree and during a continuing growth in diameter of the roll while maintaining the top line of contact at least at the level which it had attained at the start of said separation of said one bottom line of contact from the other bottom line of contact with said roll, and engaging one side of the roll undergoing formation along a fourth parallel line of contact approximately at the time when said one bottom line of contact begins to separate from the other bottom line of contact and during at least part of the time when said roll is growing in diameter to stabilize said roll and prevent its displacement laterally from said two lines of contact near the bottom of the roll.

4,256,270

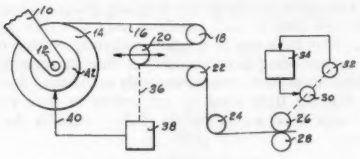
TENSION CONTROL SYSTEM FOR AN UNWINDER

Frank X. Lee, New York, and Leonard C. Krimsky, Spring Valley, both of N.Y., assignors to Worldwide Converting Machinery, Inc., Allendale, N.J.

Filed Aug. 6, 1979, Ser. No. 63,705

Int. Cl.³ B65H *19/00, 17/02*

U.S. Cl. 242—75.5 **6 Claims**



1. In a system for unwinding material from a roll having a mandrel, apparatus including means for withdrawing material from said mandrel at a desired rate, means for exerting a retarding torque on said mandrel to regulate the tension in said material in the course of an unwinding operation, a mechanical differential having a pair of side gears and an input shaft, means for coupling one of said side gears to said mandrel, means for applying a braking force to the other side gear, and means operative during an unwinding operation for driving said input shaft in such a direction as to apply to said mandrel a biasing torque in a direction opposite to the direction of said retarding torque.

4,256,271

FISHING REELS

Jean Ruin, Thyez, France, assignor to Mitchell S.A., Thyez, France

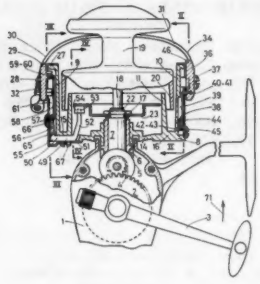
Filed Jan. 16, 1979, Ser. No. 3,976

Claims priority, application France, Mar. 6, 1978, 78 06908

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **8 Claims**

1. A fishing reel comprising a casing, a drum having a base rotatably supported by said casing, means for manually rotating said drum, a non-rotating spool concentric with said drum and positioned above said drum, at least one support arm spaced from the periphery of the drum, a securing arm connecting said support arm with the base of said drum, a pick-up arm rotatably mounted on said support arm, a pick-up bar extending across said spool having one end supported by said pick-up arm and the other end pivotally mounted for movement with said pick-up arm between an open position and a closed position, resilient tumbler means for resiliently holding said pick-up bar in which ever of said positions it occupies, and release means for moving said pick-up bar from open position to closed position upon rotation of said drum, said release means comprising a double lever having a shaft portion extending transversely of the rotational axis of the drum and rotatably supported by said securing arm, a first arm inside the drum and a second arm outside the drum, a stationary stop positioned to



be engaged by said first arm to pivot said double lever about the axis of said shaft portion upon rotation of said drum, and a connecting rod having a first end pivotally connected to said second arm of said double lever and a second end pivotally connected with said pick-up arm, the pivot point of said first end of said connecting rod with said second arm of the double lever being always on the same side of a line connecting the pivot point of the second end of said connecting rod with the axis of the shaft portion of said double lever, whereby said double lever is pivoted about the axis of said shaft portion by engagement of said first arm of said double lever with said stationary stop upon rotation of said drum and acts through said connecting rod to pivot said pick-up arm and thereby move said pick-up bar from open to closed position.

4,256,272

METHOD FOR SECURING A RESERVE WINDING ON A TUBE

Gerd Reisser, and Kurt Lovas, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert and Salzer, Ingolstadt, Fed. Rep. of Germany

Division of Ser. No. 724,521, Sep. 20, 1976, Pat. No. 4,154,409. This application Mar. 16, 1979, Ser. No. 21,154

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2543986

Int. Cl.³ B65H *54/02*

U.S. Cl. 242—18 PW **3 Claims**

1. A method of securing a reserve winding of thread on a tube supported on winding apparatus having a traversing thread guide and a thread delivery source comprising the steps of:

forming a reserve winding of a length of thread about said tube adjacent one end thereof;

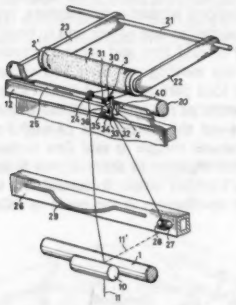
providing a free end portion of said thread reserve;

providing a movable auxiliary thread guide;

supporting said movable auxiliary thread guide along side said tube for movement in a direction generally along the axis of said tube;

deflecting said free end portion of said thread reserve toward the longitudinal center of said tube by means of

engagement and movement of said auxiliary thread guide in said direction along the axis of said tube; and



covering said free end portion with subsequent thread windings laid by said traversing thread guide.

4,256,273

SAFETY BELT RETRACTORS

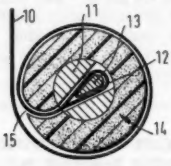
David W. Burleigh, Bognor Regis, England, assignor to Britax (Windgard) Limited, Chichester, England

Filed Jul. 3, 1979, Ser. No. 54,435

Claims priority, application United Kingdom, Jul. 5, 1978, 28844/78

Int. Cl.[3] **A62B** *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.4 R **6 Claims**



4. A safety belt retractor comprising a locking mechanism, a spindle having a rigid core and a radial outer layer formed of energy absorbing material which is capable of absorbing energy by substantially inelastic deformation, a safety belt wound on said radially outer layer and means for attaching an end of said safety belt to said core, whereby deformation of said radially outer layer permits extraction of the belt from the retractor when rotation of the spindle is inhibited by the locking mechanism and a predetermined belt loading is exceeded.

4,256,274

TAPE REVERSAL CONTROL

Etienne A. M. Schatteman, Wemmel, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed May 14, 1979, Ser. No. 38,477

Claims priority, application France, May 24, 1978, 78 15481

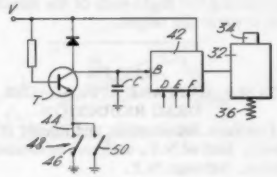
Int. Cl.[3] **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—201 **9 Claims**

5. In a magnetic tape recording and playback apparatus of the bi-directional type which includes means for reversing the direction of motion of the tape in response to an electrical impulse, said reversing means being associated with driving means having an active element portion comprising an intermediate gear, having a shaft, which can be moved by the reversing means between two operative positions, and which in each of its operative positions drives a shaft of a take-up reel for transferring the magnetic tape from a tape supply reel to said take-up reel, whatever the direction of motion of the tape, the improvement comprising:

a position detector having means for detecting the position of said intermediate gear including an electric switch having contacts which are actuated by the displacement of the intermediate gear, the contacts of said switch being only closed if the said gear is correctly positioned in each of its operative positions; and

electrical circuit means coupled to the position detector for producing an output signal when the positioning of said



intermediate gear is in either one of said operative positions,

one of the contacts of said electric switch being movable and comprising the shaft of the intermediate gear, the other contact being formed by a conductive element through which the said shaft passes and with which the contact is formed when the shaft of the gear occupies either of its two operative positions, the said shaft of the gear being coupled to ground and the conductive element being coupled to the emitter of the transistor.

4,256,275

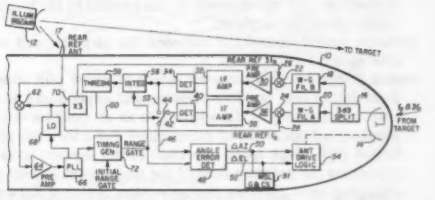
HOMING SYSTEM AND TECHNIQUE FOR GUIDING A MISSILE TOWARDS A METAL TARGET

Edward A. Flick, Seminole; Timothy R. Holmes, St. Petersburg, and Myles A. Larson, South Pasadena, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Nov. 1, 1978, Ser. No. 956,727

Int. Cl.[3] **F41G** *7/00;* **F42B** *15/02;* **G06F** *15/50*

U.S. Cl. 244—3.19 **9 Claims**



1. A homing system for guiding a missile towards a metal target where the metal target is illuminated with a transmitted radar signal of a predetermined frequency, the metal target reflecting the radar signal and producing harmonic signals having frequencies harmonic with the predetermined frequency, comprising:

a tracking antenna mounted in the missile and moving through a scan pattern for receiving the harmonic signals and the reflected radar signals;

a first detector responsive to the received radar signals to produce a first strength signal proportional to the signal strength of the received radar signals;

a second detector responsive to at least a selected one of the harmonic signals to produce a second strength signal proportional to the signal strength of the selected harmonic signal;

a switching circuit connected to receive said strength signals and to route said first strength signal to an output terminal

thereof when said second strength terminal is less than a preset threshold and to route said second strength signal to said output terminal when said second strength signal is greater than said preset threshold;

an error circuit for monitoring the position of the antenna in the scan pattern, for receiving the strength signal from said output terminal and for producing error signals indicating the direction of the target relative to the missile according to the position of the antenna at the time the strongest selected harmonic signal in the scan pattern was received; and

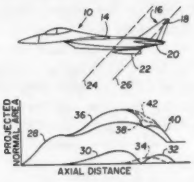
a guidance and control system responsive to the error signals for correcting the flight path of the missile to guide the missile towards the target.

4,256,276

ADJUSTABLE AIRPLANE APPENDAGES FOR WAVE DRAG REDUCTION

Victor R. Ciminera, Farmingville, and Ronald H. Hendrickson, Massapequa, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,641
Int. Cl.³ B64C *7/00*
U.S. Cl. 244—118.1 **5 Claims**



1. For an airplane with a fuselage having an empennage of a dorsal fin and elevator and wings all of which present a cross-sectional area distribution that has discontinuities from nose to tail of the airplane, a means to arrange external appendages to the airplane to fill in any area discontinuities and minimize drag penalties during flight of the airplane, said means comprising:

attachment means for uniting said appendages with the airplane, said attachment means being mounted to the airplane so as to move along an axis parallel to the longitudinal axis of the airplane;

actuator means connected between the airplane and said attachment means; and

means to operate said actuator means to move said attachment means and variably position said appendages along their axis in flight of the airplane to an aft position at low Mach speed operation of the airplane and a forward position at high Mach speed operation of the airplane so as to reposition the pressure field of the store to track with the changing area diagram discontinuities between forward and aft portions of the fuselage, such as arises typically between wing and empennage of the airplane in flight, to decrease drag.

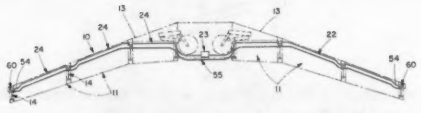
4,256,277

ACTUATOR SYSTEM FOR AIRCRAFT CONTROL SURFACES

David G. Embree, 1916 Nebraska Rd., Rockford, Ill. 61108

Filed Sep. 12, 1978, Ser. No. 941,695
Int. Cl.³ B64C *13/28*
U.S. Cl. 244—213 **6 Claims**

1. An actuator system for positioning and maintaining substantial symmetry between first and second control surfaces on opposite sides of an aircraft, said system including, a power drive unit, a first actuator mechanism for connection to said first control surface for positioning said surface between extended and retracted positions, a second actuator mechanism for connection to said second control surface for positioning said second surface between extended and retracted positions symmetrical with the positions of said first control surface, a primary load path defined by first and second mechanical segments having opposite outer ends drivingly connected to said first and second actuator mechanisms, respectively, and inner ends connected to said power unit to be driven thereby to provide power to said first and second actuator mechanisms for symmetrically moving said first and second control surfaces, a backup load path including a shaft extending continuously from oneside of the aircraft to the other and drivingly connected between the outer ends of said first and second segments to transmit torque to said first actuator mechanism from said second segment in the event of failure in said first segment and to transmit torque from said first segment to said second actuator mechanism in the event of failure in said sec-



ond segment, said shaft having a central axis spaced laterally from the longitudinal axis of said primary load path, and means for sensing torsional deflection in said shaft resulting from the transmission of torque thereby and for producing a signal in response thereto to provide an indication of failure in said primary load path.

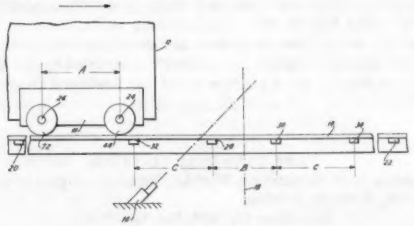
6. A method of detecting failure in a primary load path of an actuator system for positioning control surfaces on opposite sides of an aircraft wherein substantial torque normally is not transmitted through a continuous backup shaft connected between opposite ends of the primary load path but is in the event of a failure in the primary load path, said method comprising the steps of detecting torsional deflection through said continuous backup shaft and providing a signal indicating failure in said primary path when such torsion deflection exceeds a predetermined magnitude.

4,256,278

RAILWAY FREIGHT CAR IDENTIFICATION SYSTEM

W. Woodward Sanville, Brentwood, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,623
Int. Cl.³ B61L *25/04*
U.S. Cl. 246—247 **6 Claims**



1. A system for determining if a railway car passing a sensing station along a length of track is a freight car, said system comprising:

a first transducer adapted to detect the passing of a wheel at a first location along said track;

a second transducer at a second location along said track spaced downrail from said first location by a distance slightly less than the minimum spacing between axles of a freight car truck;

a third transducer at a third location along said track spaced downrail from said first location by a distance slightly

greater than the maximum spacing between axles of a freight car truck; and

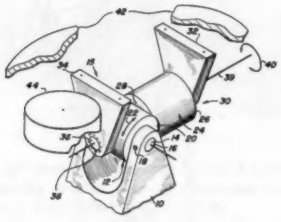
means for determining if a first wheel of a railway car passing from said first location toward said second location is between said second and third transducers when a second wheel of said car passes said first transducer.

4,256,279

POWERED GIMBAL SYSTEM

Don M. Duel, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1978, Ser. No. 957,588
Int. Cl.³ F16M *11/12*
U.S. Cl. 248—184 **5 Claims**



1. Gimbal apparatus having at least a first and a second gimbal axis for allowing mechanical freedom for a platform and for driving the platform to a desired direction with respect to a pedestal, the apparatus comprising:

a first drive motor having a case and a rotor, said case and said rotor of said first drive motor having a first common axis, one of said case and said rotor of said first drive motor being fixed to the pedestal, the other of said case and said rotor of said first drive motor being a first rotatable member with respect to said one of said case and said rotor of said first drive motor, said first rotatable member providing a rotatable output from said first drive motor; and

a second drive motor having a case and a rotor, said case and said rotor of said second drive motor having a second common axis, said second common axis of said case and said rotor of said second drive motor and said first common axis of said case and said rotor of said first drive motor having an angle greater than zero therebetween, one of said case and said rotor of said second drive motor being fixed to said first rotatable member, the other of said case and said rotor of said second drive motor being a second rotatable member with respect to said one of said case and said rotor of said second drive motor, said second rotatable member providing a rotatable output from said second drive motor, said second rotatable member being fixed to the platform, said first and second common axes having essentially a point of intersection therebetween, said point of intersection lying within one of said first and second drive motors and said first and second common axes being respectively common with the first gimbal axis and the second gimbal axis.

4,256,280

CONSOLE SUPPORT BRACKET

James E. McCutchen, 37 S. Del Norte Rd., Greenville, S.C. 29607

Filed Sep. 5, 1978, Ser. No. 939,480
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—220.2 **2 Claims**

1. A bracket for supporting a console having spaced side walls upon which a radio or the like is mounted in a vehicle which permits readily removal of and mounting of said console, said bracket comprising:

a base plate including,

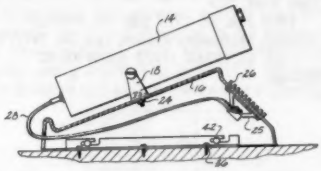
(i) a substantially flat base,

(ii) fastening devices securing said base to said vehicle,

(iii) opposed spaced elongated flanges extending outwardly at right angles to said base, and

(iv) spaced L-shaped slots provided in said flanges with the slots in one flange being directly opposite the sots in said other flange,

elongated strips carried by said spaced side walls of said console,



laterally extending studs carried by said elongated strips,

said studs having an enlarged head on the remote ends thereof and having a reduced diameter intermediate portion,

said studs being positioned on said console to be in alignment with said L-shaped slots of said base member,

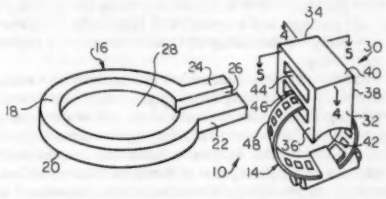
whereby said console can be readily mounted on said base plate by inserting said studs into said L-shaped slots.

4,256,281

CUP HOLDING APPARATUS

Linda D. Harris, Detroit; Frank J. Paretti, Roseville, and Sharon L. McWhorter, Highland Park, all of Mich., assignors to Galactic Concepts & Designs, Inc., Highland Park, Mich.

Filed Apr. 27, 1978, Ser. No. 900,346
Int. Cl.³ A47B *96/06*; A47K *1/08*
U.S. Cl. 248—231 **7 Claims**



1. A cup holder comprising:

a cup holding member having an opening therein adapted to receive said cup, said cup being supported within said member by mutual engagement of edges defining said opening and portions of said cup;

a tab portion integrally formed on said cup holding member and projecting outwardly therefrom in a radial plane lying perpendicular to the longitudinal axis of said cup, said tab portion including a slit extending radially outwardly from said opening through said tab portion to the outer end thereof;

mounting means adapted to be attached to a supporting structure, said mounting means including first and second generally rectangular slots positioned in substantially parallel spaced planes, one of said slots directly receiving said tab portion so as to support said cup holding member in cantilevered relationship thereto; and

attaching means for removably supportingly attaching said mounting means to said supporting structure, said attaching means including a portion received within the other of said first and second slots and another portion at least

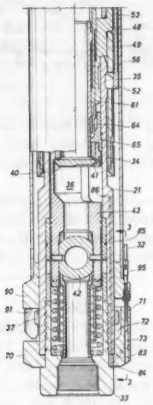
partially surrounding said supporting structure so as to removably supportingly attach said mounting means to said supporting structure without requiring alteration of said supporting structure.

4,256,282

SUBSEA VALVE APPARATUS HAVING HYDRATE INHIBITING INJECTION

Pierre H. Goldschild, Vulaines sur Seine, and Jean Franc, Paris, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,025
Claims priority, application France, Jun. 28, 1977, 77 19745
Int. Cl.³ F16K *31/12*; E21B *43/12*
U.S. Cl. 251—58 **7 Claims**



1. In a subsea valve apparatus for use in controlling flow of fluids from an offshore well and including a valve body defining a flow passage, valve means in said body for opening and closing said passage, and a control unit releasably connected to said valve body for actuating said valve means, the improvement comprising;

first and second conduit means on said control unit and said valve body respectively for supplying a hydrate formation inhibiting fluid under pressure to said flow passage, said second conduit means including port means extending through the wall of said valve body and communicating with said flow passage at a location below said valve means, slidably engageable connector means on said control unit and said valve body for automatically connecting said first and second conduit means as said control unit is releasably connected to said valve body; and

closing means in said second conduit means for preventing flow of fluids from said flow passage to the exterior of said valve body via said port means when said control unit is disconnected from said valve body.

4,256,283

PIVOTAL BALL CHECK VALVE

Bobby J. Reneau, 15527 Morales, Houston, Tex. 77039, and Luther L. Manchester, Jr., 810 Woodstock, Bellaire, Tex. 77401

Filed Apr. 6, 1979, Ser. No. 27,945
Int. Cl.³ F16K *25/00, 3/314*
U.S. Cl. 251—62 **9 Claims**

1. A pivotal ball valve, comprising:

a valve housing including a main housing section including a bore forming a fluid passageway for the flow of fluid along the axis of said main housing section bore;

an actuator housing section connected with said main housing section, said actuator housing section including an actuator bore which opens to said main housing section bore;

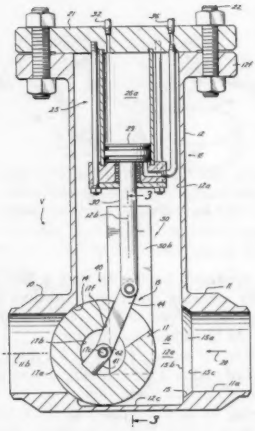
said main housing section bore including first and second annular seating surfaces being formed across the axis of said main housing section bore;

a ball valve element;

an actuator shaft positioned in said actuator housing;

power means mounted at least partly in said actuator housing for moving said actuator shaft axially within said actuator housing section bore;

said ball valve element having a first bore extending through said ball valve element, said first ball valve element bore having an axis transverse to said main housing section bore axis;



said ball valve element having a second bore with an axis perpendicular to said first ball valve element bore axis, said second valve bore opening into said first valve bore;

a yoke connection to said ball valve element in said first ball valve element bore;

a link element extending through said second ball valve element bore into said first ball valve element bore; and

first pivotal connection means pivotally connecting said yoke and link element together and second pivotal connection means pivotally connecting said link element to said actuator shaft whereby said ball valve element is mounted for rotation with respect to said first ball valve element bore axis whereby said ball valve element is moved axially along said main housing section bore and rotatingly into a seated position against one of said annular seating surfaces.

4,256,284

HIGH ENERGY LOSS FLUID FLOW CONTROL DEVICE

Harold J. Balhouse, Corona, Calif., assignor to Consolidated Controls Corporation, El Segundo and Electric power Research Institute, Inc., Palo Alto, both of, Calif.

Filed Apr. 4, 1979, Ser. No. 26,838
Int. Cl.³ F16K *47/06*
U.S. Cl. 251—126 **21 Claims**

1. A high energy loss fluid flow control device comprising:

an elongated body having an axially extending bore with longitudinally spaced apart inlet and outlet passages in communication with said bore;

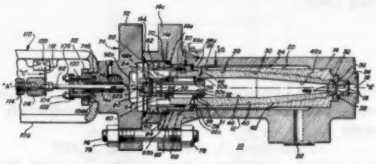
an elongated valve member mounted for axial movement in said bore between closed and open, longitudinally spaced apart position;

said valve member including an outer surface spiralling about a longitudinal central axis of said member from a

minimum diameter portion adjacent one of said passages toward a maximum diameter portion adjacent the other of said passages;

said bore having a surface in close facing relation with said spiralling surface of said valve member and spiralling about said longitudinal axis from a minimum diameter portion adjacent said one passage toward a maximum diameter portion adjacent said other passage;

said spiralling surfaces of said bore and valve member defining a spiral fluid flow path extending between said inlet passage and said outlet passage having a generally polygonal cross-section transverse cross-sectional area as viewed on a plane extending radially outward of said longitudinal



axis, said cross-sectional area having a radial dimension substantially smaller than its dimension normal thereto extending longitudinally of said axis,

said spiralling surface of said maximum diameter portion of said valve member gradually transitioning into a cylindrical surface of said member extending oppositely away from said minimum diameter portion in an axial direction,

said spiralling surface at said maximum diameter portion of said bore of said valve body transitioning gradually into a cylindrical surface extending oppositely away from said minimum diameter portion in an axial direction; and

means for moving said valve member longitudinally in said bore between said open and closed positions.

4,256,285

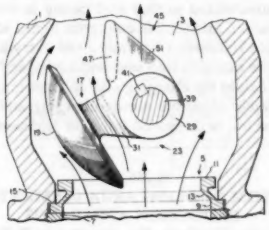
ECCENTRIC ROTARY VALVE WITH CONTROL-IMPROVING WING MEMBER

James V. Davidson, Lansdale, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 811,536, Jun. 30, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,209

Int. Cl.³ F16K *39/06, 1/20*

U.S. Cl. 251—283 **5 Claims**



1. A fluid flow controlling rotary valve comprising

a housing containing a fluid flow path with a central axis,

a valve seat located within said housing along said flow path,

a plug means having a sealing face cooperating with said valve seat in the closed position to block said fluid flow path,

a support shaft arranged to carry said plug means and being rotatable on an axis which is normal to and spaced from the axis of said valve seat so that rotation of said shaft moves said plug means relative to said valve seat and

a wing member means attached to said plug means for movement therewith in said fluid flow path and located entirely on one side of an axis of said plug means, said plug means axis coinciding with said central axis when said plug means is in said closed position; said wing member being arranged to exert a rotative force on said support shaft in the presence of fluid flow along said fluid flow path which force progressively decreases as said plug means moves progressively in a valve opening direction; said plug means exerting a first rotative force on said shaft in a valve opening direction in the presence of fluid flow along said flow path and said wing member means being constructed and arranged to exert a second rotative force on said shaft in said valve opening direction in the presence of fluid flow along said flow path, said first and second forces thereby acting together to produce a net unidirectional force to move said plug toward a valve opening position.

4,256,286

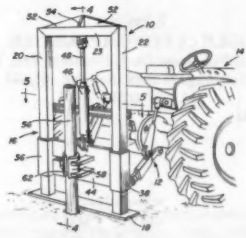
POST PULLING DEVICE

Jimmy R. Hudgins, Rte. 2, Hermleigh, Tex. 79526

Filed Oct. 30, 1979, Ser. No. 89,473

Int. Cl.³ E21B *19/00*

U.S. Cl. 254—30 **5 Claims**



1. A pulling device comprising, in combination:

an upstanding frame, a ground engaging base connected at the bottom of said frame;

a plate member slidably connected to said frame for vertical movement along said frame;

powered means connected between said frame and said plate member for causing powered movement of said plate; and

clamp means attached to and movable with said plate member for clamping a post to be removed from the ground, said frame including a pair of side members, a pair of sleeves at least partially surrounding each of said side members and attached to said plate for slidably connecting said plate to said side members, said clamp means including one fixed jaw attached to said plate and one movable jaw slidably connected to said plate, jaw movement means connected to said movable jaw for causing movement of said jaw movable to and from said fixed jaw, said frame including a top member extending between said side members and said powered movement means including a first hydraulic cylinder extending between said top member and said plate, a mounting arm connected to said movable jaw, a slot formed in said plate and receiving said mounting arm slidably therein, said jaw movement means including a second hydraulic cylinder connected to said mounting arm.

4,256,287

HANDRAIL AND METHOD OF MAKING THE SAME

Robert A. Birmingham, Memphis, Tenn., assignor to Owen Lumber & Millwork, Inc., Memphis, Tenn.

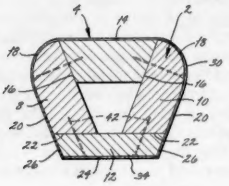
Filed Feb. 26, 1979, Ser. No. 15,299

Int. Cl.³ E04H *17/14*

U.S. Cl. 256—59 **16 Claims**

1. A handrail or similar device comprising: a core formed

from segments of relatively rigid material joined together into a configuration capable of being easily gripped, and including an upper horizontal member, a lower horizontal member of trapezoidal cross-section, and two side members extending between and being attached to the upper and lower members



such that the bottom surfaces of the side members are joined to the top surface of the lower horizontal member with the outer surfaces of the side members being flush with the side surfaces of the lower horizontal member; and a covering of laminating material attached to and extended over at least a portion of the core.

4,256,288

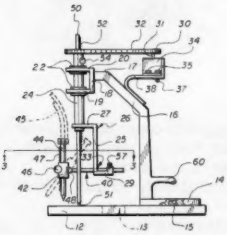
HOLE CUTTING APPARATUS

Miguel E. Rojas, 943 Greatwood, Houston, Tex. 77013

Filed Aug. 3, 1979, Ser. No. 63,444

Int. Cl.³ B23K *7/10*

U.S. Cl. 266—70 **17 Claims**



1. A portable hole cutting apparatus for cutting circular holes in flat metal plate, comprising

a weighted base having a generally flat bottom surface for mounting on the plate,

a generally upright frame attached to said base and housing an upper laterally extending portion,

a generally U-shaped yoke housing a pair of vertically spaced extending horizontal yoke bracket flanges, each one of said pair of vertically spaced yoke flanges having a circular aperture disposed therein vertically registering with said aperture in the other one of said yoke flanges,

a pair of circular bearings one of which is disposed for rotation in each of said yoke flanges adjacent said vertically aligned apertures,

an elongated drive tube vertically disposed in said yoke bracket apertures and journaled for rotation in said bearings,

drive means mounted on said frame and connected to said drive tube for rotating said drive tube at a desired rotational speed,

a cutting torch,

torch holding bar means adapted for carrying said torch,

a drive bracket including a short horizontal end rigidly attached to the lower end of said drive tube, said bracket including a portion of the lower end of which includes mounting means for mounting said torch holding bar means in a horizontal relationship to the metal plate, said drive bracket rotating said torch holding bar means and said cutting torch in response to rotation of said drive tube, said torch holding bar means cooperating with said drive bracket for permitting horizontal movement of said cutting torch with respect to said drive bracket for adjusting the radius of the circle scribed by said cutting torch, and

a circle center marking rod concentrically disposed through said drive tube and cooperating therewith for at least limited vertical movement therethrough, said rod movable to a lower position to engage the surface of the metal plate for marking the center of the hole to be cut, and movable to a raised position while the hole is being cut by said torch.

4,256,289

CONVERTER ARRANGEMENT

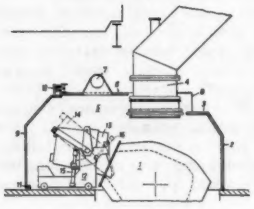
Ludwig Neuner, Leonding, and Friedrich Laimer, Perg, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 17, 1979, Ser. No. 39,827

Claims priority, application Austria, May 24, 1978, 3768/78

Int. Cl.³ C21B *7/00*

U.S. Cl. 266—159 **6 Claims**



1. In a converter arrangement of the type including a tiltable converter vessel, a casing surrounding said tiltable converter vessel and having a ceiling and side walls, a principal discharge conduit for conducting away refining gases, and a secondary discharge conduit for conducting away smoke forming during charging and pouring off, said secondary discharge conduit being connected to said ceiling, one of said side walls of said casing having an opening to permit charging of the vessel and a door provided for closing said opening, the improvement which is characterized in that said casing is widened in the tilting direction of said tiltable converter vessel so as to form a widened space sufficient to permit a car carrying a charging container to be movable into said widened space through said opening at a height for charging said container, and said opening is completely closeable during charging and pouring off, when said car has been moved into said widened space.

4,256,290

BOTTOM COOLING ARRANGEMENT FOR REDUCTION APPARATUS

Larry A. Coccia, Elizabeth, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 15, 1979, Ser. No. 85,162

Int. Cl.³ F27B *1/20*

U.S. Cl. 266—191 **12 Claims**

1. In an apparatus for the gaseous reduction of metal oxide ore including a reactor vessel having an elongated vertically disposed reaction chamber and a lower discharge chamber,

gas inlet means and ore charging means adjacent the upper end of said reaction chamber,

gas outlet means communicating with said discharge chamber, and

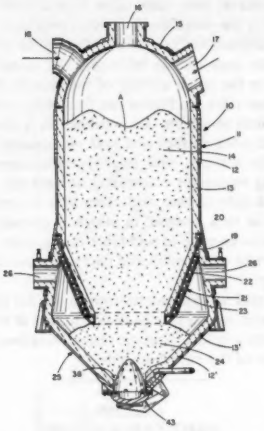
a discharge outlet for discharging reduced material from

said discharge chamber including an opening in the vessel, the improvement comprising;

a discharge door,

means movably supporting said door for movement between closed and open positions relative to said opening,

said door including an external body portion supported over said opening,



an internal body portion supported on said external body portion and in closed position of said door being disposed within said outlet,

and cooling means on said internal body portion for directing a cooling fluid to said discharge chamber.

4,256,291

THREE-POSITIONS SLIDING GATE VALVE

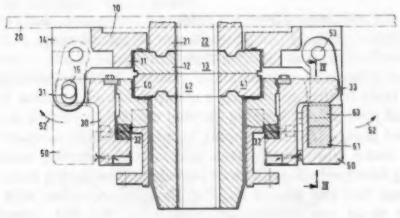
Enrico Dellepiane, Via Dassori 29/20; Roberto Ricci, Via A.-Boito 17/8, and Giovanni Timossi, Via M.Gallino 17c/13, all of Genoa, Italy

Filed Oct. 23, 1979, Ser. No. 87,520

Claims priority, application Italy, Oct. 25, 1978, 12838 A/78

Int. Cl.[3] C21C *5/48*

U.S. Cl. 266—272 **6 Claims**



1. Improved sliding discharge gate, of the type which comprises an upper, fixed plate firmly connected to the base of the ladle, a lower support plate supported, in such a way that its height can be adjusted, from the upper plate and an intermediate plate which is slidable by suitable actuating means, in which the upper, fixed plate and the slidable intermediate plate are apertured and are each connected to a respective apertured refractory brick, in which in addition said lower support plate provides a pair of guides on which the longitudinal edges of the intermediate slidable plate slide, characterised by the fact that the apertures in the two said apertured bricks are disposed in a position which is central both relative to their longitudinal direction and relative to their transverse direction, in such a way that, from an open position of the gate in which the apertures in the two bricks are in register, two symmetrical closed position can be reached.

4,256,292

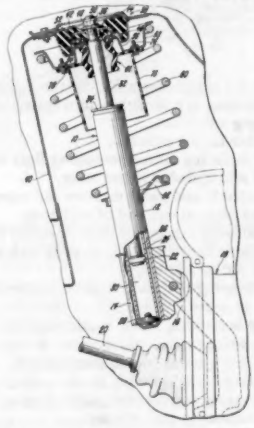
JOUNCE BUMPER FOR SUSPENSIONS

Leo S. Sullivan, Jr., and Patsy DeVincent, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1978, Ser. No. 964,594

Int. Cl.[3] F16F *13/00*

U.S. Cl. 267—8 R **2 Claims**

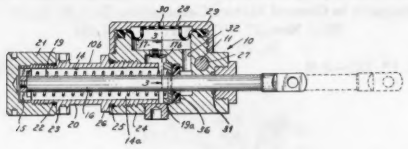


1. A telescoping shock absorbing and suspension unit operatively connected between sprung and unsprung masses of a vehicle comprising a support tube operatively connected to said unsprung mass of said vehicle, a cylinder tube fixed in said support tube having a hydraulic damping fluid therein, a valved piston mounted for sliding reciprocal movement in said cylinder tube, a piston rod operatively connected to said piston and extending through one end of said cylinder tube and said support tube, a mount for said unit attached to said sprung portion of said vehicle, fastener means operatively connecting the free end of said piston rod to said mount, a jounce bumper, attachment means securing said jounce bumper adjacent to said mount, said jounce bumper being formed of a polymer material to yieldably resist predetermined movement of said sprung and unsprung masses toward one another, said jounce bumper comprising a generally cylindrical and barrel-shaped wall encircling said piston rod and having upper and lower ends, said wall having a radially outwardly extending knee portion intermediate said upper and lower ends, said knee portion being adapted to deflect radially outwardly at a low spring rate when said bumper is initially loaded by contact with one end of said support tube, said wall of said jounce bumper having first and second internal contoured surface portions which intersect at said knee portion and which extend from opposite sides thereof to said upper and lower ends and which progressively engage one another in response to the progressive outward radial deflection of said knee portion to provide an increasing spring rate and increased yielding resistance to movement of said masses toward one another, an annular suspension spring support disposed below said mount and providing a seat for the upper end of a coil suspension spring encircling said cylinder tube, said attachment means comprising a plurality of circumferentially spaced arm means integral with and extending radially from said knee portion of said wall with the ends of said arm means being fastened to said annular suspension spring support radially inwardly from said seat.

4,256,293
THROTTLE CONTROL DASH POT

Ronald R. Burgess, Corunna, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed May 29, 1979, Ser. No. 43,388
Int. Cl.³ F16F 5/00
U.S. Cl. 267—123 **5 Claims**

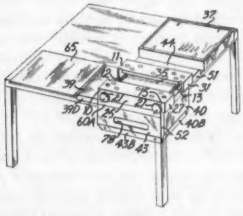


1. A dash pot for controlling a throttle throughout its movement and functioning as a throttle return spring comprising
a body defining a cylinder,
a guide member in said cylinder,
said member including means permitting fluid to flow from one end of said cylinder to the other,
a shaft connected to said guide member and extending externally of said body at one end of said body,
a spring in said body urging said shaft inwardly of said body,
means defining a chamber communicating with said cylinder at said one end of said body,
a diaphragm forming one wall of said chamber and exposed to ambient pressure,
and an orifice and check valve in said body interposed between said chamber and said cylinder at said one end of said body for metering said communication,
said check valve being operable to open when the shaft is moved outwardly and thereby permit fluid to flow freely from the chamber to the cylinder,
said check valve being operable to close and thereby force fluid flow through said orifice from the cylinder to the chamber when the shaft is moved inwardly,
means on said body for pivotally mounting said body in association with a carburetor at a point adjacent said one end of said body,
an incompressible fluid in said cylinder and said chamber.

4,256,294
PORTABLE WORKBENCH

Ronald P. Hickman, and Alan F. Styman, both of Jersey, Channel Islands, assignors to Inventec Licensing B.V., De Leersum, Netherlands

Filed May 15, 1979, Ser. No. 39,297
Claims priority, application United Kingdom, May 25, 1978, 22529/78
Int. Cl.³ B25B 1/22
U.S. Cl. 269—16 **17 Claims**

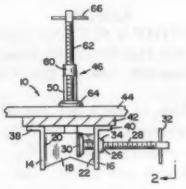


1. A portable workbench and carrying case, comprising:
a workbench including (1) front and rear vise beams having facing surfaces and having upper surfaces which together define the working surface of the workbench and (2) vise operating means operatively connected between the front and rear vise beams for moving them relative to one another in the front-to-rear direction to enable the gripping of a workpiece between the facing surfaces thereof;
a carrying case comprising at least four sides, including a front side, a back side and at least two additional sides comprised of (1) a base side and a top side or (2) two end sides, means foldably interconnecting said at least four sides for movement thereof between a closed condition, in which said at least four sides form a box-like structure encircling the workbench for carrying, and an open condition adapted for use on a table-top, in which the case back side rests on the table-top, the workbench is supported on the upper surface of the case back side and the other case sides are folded out from said closed condition to positions in which said workbench is uncovered such that said work surface and said vise operating means are accessible for use, said foldably interconnecting means including means for connecting at least one other side to said back side so that said other side is capable of being folded out to a position in which it extends downwards adjacent to an edge of said table-top to coact therewith to restrain said workbench and carrying case in place on the table top;
means on said workbench and said case for mounting said workbench on said case back side so that at least one of the vise beams is held against movement relative to the case in the plane of the case back side.

4,256,295
ADJUSTABLE CLAMP

Elmer A. Egner, 3940 Fontainebleau Dr., Tampa, Fla. 33614, assignor to Elmer A. Egner; Leonard M. Anton and Carolyn A. Egner, all of Tampa, Fla.

Filed Apr. 3, 1980, Ser. No. 136,871
Int. Cl.³ B25B 1/20
U.S. Cl. 269—45 **22 Claims**



1. An adjustable clamp for holding a workpiece, said clamp comprising: a body comprising a pair of spaced apart, permanently fixed jaws and a support piece disposed in interconnecting, substantially perpendicular relation between said jaws, said body further comprising a clamp positioning means fixed to said jaws; a first clamping member movably mounted on one of said jaws; a second clamping member movably mounted on said clamp positioning means, said second clamping member being selectively disposable on said clamp positioning means in at least first and second angular clamping positions with respect to an axis substantially parallel to the first clamping member.

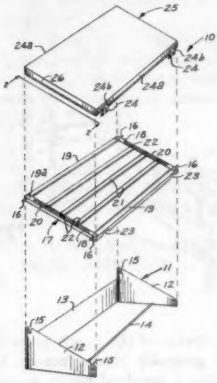
4,256,296
PRINTED CIRCUIT BOARD ASSEMBLY FIXTURE

Karol V. Scheinert, 2285 Montebello Dr. West, Colorado Springs, Colo. 80907

Filed Feb. 25, 1980, Ser. No. 124,653
Int. Cl.³ B25B 5/02
U.S. Cl. 269—45 **1 Claim**

1. A printed circuit board assembly fixture, comprising, in combination, a support rack for placement on a work bench, a frame received on said rack for adjustably receiving a plurality of said printed circuit boards, and a top cover snapably engag-

ing said frame for holding the components in place to be soldered, said support rack comprising a pair of parallel, spaced-apart side members that are fixedly secured to a rear member, and a rod fixedly secured between said side members for rigidity, a pair of spaced-apart recessed openings being included in the top edges of said members of said rack, for removably receiving pins fixedly secured, and projecting from, a pair of end members of said frame, and said end members being fixedly secured to a pair of parallel, spaced-apart side members of said frame, and a plurality of rails slidably received



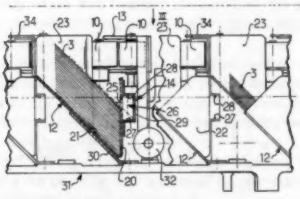
on said end members of said rack, and are secured by thumb screws, in each end, that are slidable in an elongated slot through said end members of said frame, and said printed circuit boards being held in place between said plurality of rails by their side edges, a pair of spaced-apart recessed openings being included in said side members of said frame, for removably receiving a pair of spaced-apart spring clips secured fixedly to the sides of said top cover, and a foam pad fixedly secured to the bottom surface of said top cover, for holding said components to be soldered in place.

4,256,297

HOPPER

Lucien Prieur, Ecouen, and Patrick Pinard, Seiches-le-Loir, both of France, assignors to Compagnie Internationale pour l'Informatique, Paris, France

Filed Sep. 13, 1979, Ser. No. 75,228
Claims priority, application France, Sep. 21, 1978, 78 27037
Int. Cl.³ B65H *31/02*
U.S. Cl. 271—207 **13 Claims**



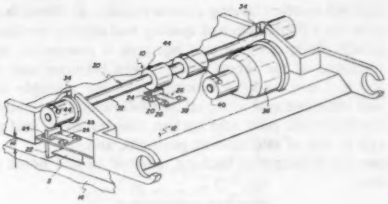
1. A hopper for receiving documents such as flat sheets fed from a conveyor and adapted to be stacked atop one another inside the hopper, comprising at least one supporting surface for said sheets and at least one retaining surface, at least one slot provided in the retaining surface through which a sheet projects when a quantity of sheets has been accumulated in the hopper to a predetermined height, said slot being disposed at said predetermined height on said surface and detection means adjacent said slot for detecting when said hopper has accumulated said quantity of sheets and at least a part of a sheet projects out of the hopper through the slot.

4,256,298

SELF-COMPENSATING REGISTRATION MECHANISM

Douglas K. Ahern, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,669
Int. Cl.³ B65H *9/04*
U.S. Cl. 271—245 **8 Claims**



1. Self-compensating registration mechanism for use with sheet feeding apparatus for advancing sheets seriatim along a travel path, such path being subject to variations in dimension transverse to the direction of sheet travel in such path, said registration mechanism comprising:

means for blocking such travel path, said blocking means being movable relative to such path to a first position wherein the blocking means is engageable by a sheet advanced along the path for registering such sheet, and a second position wherein a sheet can be advanced along such path past said blocking means;

means for urging said blocking means toward its first position; and

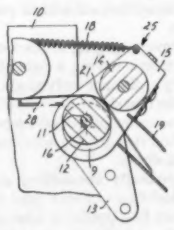
means for moving said blocking means to its second position against the force of said urging means, said moving means including a retraction mechanism and self-compensating coupling means for connecting said retraction mechanism to said blocking means whereby variations in the dimension of such travel path are automatically compensated for so that said blocking means is movable to each of its positions for any such dimension of the path.

4,256,299

MULTIPLE SHEET SENSOR AND DEFLECTOR

Raymond A. Hogenson, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 18, 1979, Ser. No. 58,527
Int. Cl.³ B65H *7/12, 5/06*
U.S. Cl. 271—262 **3 Claims**



1. In combination with a sheet feeder, an apparatus for sensing the thickness of the sheet being fed comprising

a frame,

a drive roll for driving sheet material,

means mounting said drive roll for rotation about a fixed axis in said frame,

drive means for said drive roll,

a cooperating back-up member positioned parallel and adjacent to said drive roll so as to form an elongate nip area therebetween,

means mounting said back-up member, on a pivot axis offset from said fixed axis of said drive roll to afford the limited angular rotation of said back-up member about said pivot axis and the partial revolution of said back-up member around said drive roll, thereby increasing the nip spacing between said drive roll and said back-up member, said back-up member having a home position at which said nip area has a predetermined spacing and ulterior positions at which the spacing of said nip area is responsive to the thickness of the sheets being driven between said drive roll and said back-up member, whereby multiple sheets will interpose said nip area, and following the rotation of the drive roll, push said backup member about said pivot axis to one of said ulterior positions, and

means for biasing said back-up member to said home position.

4,256,300

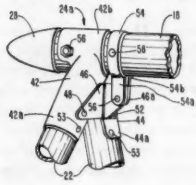
FOLDABLE PLAY GYM

Raymond W. Boucher, Dothan, Ala., assignor to Hedstrom Co., Beford, Pa.

Division of Ser. No. 908,332, May 22, 1978, Pat. No. 4,190,283, which is a continuation of Ser. No. 811,179, Jun. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 665,539, Mar. 10, 1976, abandoned. This application Aug. 31, 1979, Ser. No. 71,705

Int. Cl.³ A47C *15/00*

U.S. Cl. 272—85 **6 Claims**



1. A play gym comprising:

A. a pair of horizontal bars,

B. a leg means for supporting corresponding ends of the bars, said leg means including

1. a pair of upstanding tubular legs,

2. a joint connecting each of said legs to a different one of the horizontal bars, each said joint including a first sleeve receiving an end of a horizontal bar, each said first sleeve being formed with a pair of diametrically opposite ears,

3. a second sleeve engaging around each said leg, each said second sleeve having a pair of ears spaced apart along said leg a distance only slightly greater than the diameter of the first sleeve so that said first sleeve can be received between the ears of said second sleeve with the ears of said first sleeve lying adjacent to the sleeve ears of the second sleeve,

4. means for pivotally connecting an adjacent pair of socket and sleeve ears of each joint so that the legs can be swung from first positions wherein they lie perpendicular to the horizontal bars to second positions wherein they lie substantially parallel to the horizontal bars, and

5. means for releasably maintaining the legs in their first positions so that they support said ends of the bars above the ground, and

C. means for supporting the opposite ends of the bars above the ground.

4,256,301

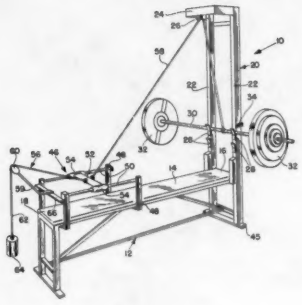
SOLO-OPERABLE BENCH PRESS DEVICE

Richard G. Goyette, 116 Dexter St., Cumberland, R.I. 02864

Filed Aug. 27, 1979, Ser. No. 70,304

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—123 **8 Claims**



1. An exercise device of the bench press type wherein a person assumes a generally prone, face-up, back supported position while lifting a weighted bar to an elevated position comprising, a generally longitudinally oriented bench support for said person, an elevated tower positioned at one end of said bench, said tower positioned at said one end and adapted to support a weighted bar in a non-use position, a foot member engageable by the person's feet positioned proximate the other end of said bench and supported for at least limited back and forth longitudinal movement with respect to said bench, and means interconnecting said member and said weighted bar such that force exerted on said member by said person's feet so as to force said member towards said other end independently tends to lift said weighted bar so as to relieve a portion of the weight of said weighted bar from the arms and shoulders of said person when in a use position.

4,256,302

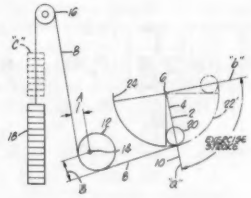
VARIABLE RESISTANCE EXERCISING DEVICE

Dennis L. Keiser, 14634 E. Annadale, Sanger, Calif. 93657, and Gideon B. Ariel, 95A Poole St., Belchertown, Mass. 01007

Filed Mar. 10, 1976, Ser. No. 665,459

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—118 **5 Claims**



1. An improved exercising device for exercising the leg of a user, comprising:

a frame member;

a lever arm having one end pivotably connected to a first portion of said frame member and extending downwardly therefrom;

a force transfer member mounted on said lever arm and spaced from said one end thereof; said force transfer mem-

ber being adapted to be engaged by the front portion of the ankle portion of the foot of a user to pivot said lever arm about said one end thereof;

a pulley member rotatably mounted on a second portion of said frame member; said pulley member having a center point;

means mounting said pulley member to said second portion of said frame member for rotation about an axis spaced from said center point of said pulley member;

weight means mounted on a third portion of said frame member for resisting pivotal movement of said lever arm in one direction; and

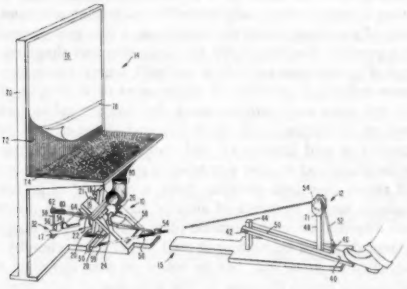
cable means having one end connected to said lever arm at a point spaced from said one end thereof and an opposite end connected to said weight means; said cable means including a central portion passing around a portion of said pulley member.

4,256,303

TENNIS PRACTICE DEVICE

Edward C. Dobbins, P.O. Box 180, Black's Harbour, New Brunswick, Canada

Filed Nov. 3, 1975, Ser. No. 628,053
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—29 A **3 Claims**



1. A tennis practice device for propelling a tennis ball to a player at a receiving location to simulate an opponent's returning a tennis ball during normal tennis playing, said practice device comprising:

A. a hammer mounted for movement between a cocked position and a ball-striking position,

B. means urging said hammer from the cocked position to the ball-striking position,

C. means for retaining a tennis ball at the ball-striking position whereby when said hammer moves from the cocked position to the ball-striking position it propells a tennis ball toward said receiving location,

D. a latch for holding the hammer in the cocked position,

E. delay means settable to begin a delay period and operative at the end of the delay period to trip the latch, thereby releasing the hammer to move to the ball-striking position, said delay means comprising,

(1) a channel having a first end and a second end tiltable between a set position and a normal release position,

(2) a ball disposed in said channel,

(3) said ball in said channel being disposed toward said first end of said channel when the channel is in the set position and rolling toward the other end of said channel when the channel is in the release position, thereby to engage and trip the latch to release the hammer, and,

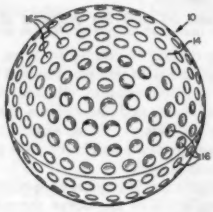
F. setting means proximate to the receiving location and connected to said hammer so that, when actuated by a player, it moves the hammer to the cocked position and moves the channel to the set position and when released by a player it permits the channel to tilt to the release position.

4,256,304

BASEBALL

Tommy L. Smith, Aurora; Edward G. Dierickx, West Linn; Walter B. Schade, Jr., Portland, and Leslie A. Pete, Central Point, all of Oreg., assignors to Athletic Training Equipment Company, Clackamas, Oreg.

Filed Nov. 27, 1979, Ser. No. 97,227
Int. Cl.³ A63B *37/00*
U.S. Cl. 273—60 B **10 Claims**



1. A resilient baseball having properties of improved durability and pitching accuracy over the period of use and otherwise exhibiting the characteristics of a regulation baseball, comprising:

a molded, resilient polyurethane foam sphere of homogeneous composition and density throughout its cross section and having an interior cellular structure characterized by a multiplicity of gas enclosing cells, said sphere having a type A-2 shore durometer hardness of less than about eighty to eighty-five,

said sphere having a smooth polyurethane surface skin, the surface of said sphere being provided with a regular surface pattern comprising a multiplicity of cup-like depressions, each of which is small in diameter as compared with the diameter of said sphere,

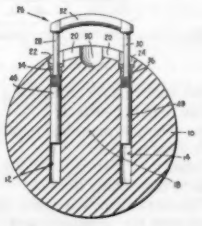
said depressions substantially covering the exterior surface of said sphere such that the spacing between depressions is comparable to the diameter of said depressions to present substantially the same aspect of surface depression configuration for any direction of travel of said sphere through the air, said smooth surface skin extending into said depressions.

4,256,305

HANDLE-EQUIPPED BOWLING BALL

Raymond S. Peterson, 415A Tide Harbor, 50 Birdseye St., Stratford, Conn. 06497

Filed Jan. 30, 1980, Ser. No. 116,683
Int. Cl.³ A63B *43/02*
U.S. Cl. 273—64 **10 Claims**



1. An easy-grip bowling ball comprising, in combination:

(a) a spherical ball body having a pair of parallel, spaced-

apart bores arranged in symmetrical relation with respect to an axis of the body,

(b) said body having a channel in its surface, extending between the mouths of said bores,

(c) a generally U-shaped handle structure comprising a pair of parallel leg portions and a yoke portion extending between and joining said leg portions,

(d) said leg portions of the handle structure being slidably movable in the bores of said body and the yoke portion of the handle structure being adapted to occupy the said channel so as to present a flush exterior surface of the body,

(e) bushings carried by said leg portions, slidable thereon and adapted to be secured in said body to provide bearings for the leg portions,

(f) stops carried by said leg portions at the extremities thereof,

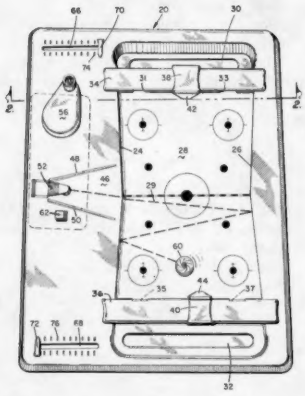
(g) coil springs carried by said leg portions, engageable with said bushings and with said stops to bias the handle structure to a retracted position wherein the yoke portion thereof occupies the said channel in a flush condition, said handle structure being shiftable against the action of said springs to an extended wherein the yoke portion is accessible to be grasped, and

(h) counterweights carried by said leg portions and extending into said body in the bores thereof, said counterweights being disposed sufficiently deep to counteract the effect of centrifugal force on the handle structure and minimize the tendency for the same to shift to its extended position against the action of said coil springs as the ball is rotated.

4,256,306
SPINNING TOP HOCKEY-TYPE GAME

Raymond J. Gross, Culver City, and Lane M. Buscho, Westwood, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 15, 1979, Ser. No. 12,525
Int. Cl.³ A63F *7/07, 7/28;* A63H *1/02*
U.S. Cl. 273—85 R **16 Claims**



1. In a game, the combination comprising:

a generally planar playing surface;

a top having an enlarged main body portion and an elongated tapered stem portion;

top spinning means for directing said top onto said playing surface adjacent the middle thereof;

first and second means adjacent opposite ends of said playing surface configured for receiving said top during game play;

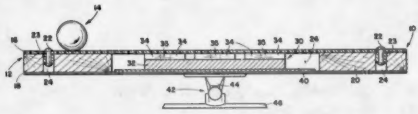
first and second oppositely disposed side rails intermediate said ends for defining a playing field, said side rails being spaced from said playing surface and configured for impact with the stem portion of the spinning top for redirecting said top toward one of the opposite ends; and

first and second manually operable blocking means intermediate said playing field and said first and second means, said blocking means being configured at least in part for impact with said stem portion for enabling a player to redirect the spinning top toward the opposite end.

4,256,307
MAGNETIC GAME

Lesley P. Brooks, 400 W. Taylor, McAlester, Okla. 74501

Filed Nov. 29, 1979, Ser. No. 98,604
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—118 A **6 Claims**

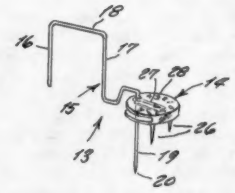


1. A magnetic game comprising a gameboard for use with a magnetizable metal game ball, said gameboard comprising a non-magnetizable block of a pre-determined size and shape having a central recess, said central recess having a bottom and being of a predetermined size and shape, a thin non-magnetizable top plate of substantially the same size and shape of said block disposed over said block and said central recess therein, means defining a plurality of target areas on a portion of the said top plate over said recess, a thin magnetizable metallic sheet of substantially the same size and shape of said recess disposed at said bottom of said recess, a magnetic plate of similar shape and smaller size relative to said sheet disposed in said recess over said metallic sheet, a plurality of individual magnetic target elements of smaller size than said magnetic plate disposed on said magnetic plate with one said magnetic element disposed beneath each said target area whereby said magnetizable game ball can be rolled on said top plate over said central recess to come to rest over one of said magnetic target elements.

4,256,308
GOLF GAME TARGET

Roy Schlueter, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jun. 13, 1979, Ser. No. 48,138
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—177 A **1 Claim**



1. A hoop device adapted for playing a game using golf balls, said device comprising an inverted U-shaped hoop member in combination with a base for installing said device in the ground, said hoop member and base including coacting means for pivotally mounting said hoop member on said base with the inverted U-shaped hoop member extending laterally from the base overlying the ground, said hoop member being wider than

the width of the ball, said base including prongs for ground insertion, said coacting means comprising a leg extending from said hoop member vertically through said base for ground insertion in rotatable fashion, and indicia means on the base and hoop member for indicating degree of rotation of said hoop member relative said base, said indicia means comprising a pointer secured to said rotatable leg and indicia visible on said base to indicate degree of pointer movement.

4,256,309

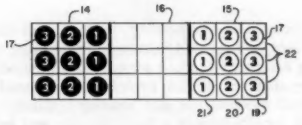
BOARD GAME APPARATUS

Philip J. McQuillan, 601 Mikes Pike, Flagstaff, Ariz. 86001

Continuation of Ser. No. 820,870, Aug. 1, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,920

Int. Cl.³ A63F *3/02*

U.S. Cl. 273—258 **5 Claims**



1. A game comprising:

(a) a playing board,

(b) means imprinted on said playing board for dividing said board into three sectors, the first said sector being interposed between the second said sector and the third said sector,

(c) means imprinted on said playing board for partitioning each said sector into a plurality of discrete areas disposed in columns and rows, said sectors each having three rows, and said playing board having three columns, all said columns extending through all of said three sectors, thereby forming twenty-seven discrete areas, nine discrete areas in each said sector,

(d) a first set and a second set of playing pieces, each said respective set of playing pieces including a plurality of game tokens adapted to be received in the discrete areas of said second and third sectors, respectively,

(e) the number of tokens in each said set of playing pieces being equal to the number of discrete areas in all said sectors,

(f) means whereby said first set of playing pieces is visually distinguishable from said second set of playing pieces,

(g) token indicia means for identifying each token of said respective sets of playing pieces, said token indicia means including first, second, and third identifying indicia equally allocated among said tokens in each said set of playing pieces.

4,256,310

LEAD-IN SYSTEM FOR RECORD PLAYER

Nobuo Suzuki, Yokohama, Japan, assignor to Katoh Electric Machinery Co., Ltd., Yokohama, Japan

Filed Jul. 9, 1979, Ser. No. 56,053

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—217 **4 Claims**

1. In a lead-in system for a record player having a turntable for playing records of various sizes which records have a lead-in groove, and further including,

(a) a tone arm (**1**) with inner and outer ends;

(b) tone arm elevating means (**15**) operatively coupled to said tone arm inner end;

(c) actuating means, including an operating member (**30**) for moving said tone arm towards a record on the turntable;

(d) tone arm sensing means (**18, 19**) including a positioning plate (**21**) for stopping said tone arm so that the outer end thereof is at a position above the lead-in groove of a record on said turntable;

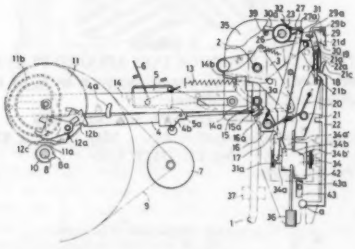
(e) operating means (**34, 40, 41**) including a cam operatively coupled to said tone arm elevating means (**15**) said actuating means, and said tone arm sensing means, for jointly and severally operating them;

(f) a selector lever (**22**) with selector means coupled to said positioning plate (**21**);

(g) stopper portions (**29*a*, 29*b***) disposed at different positions of said operating member (**30**); and,

(h) protuberance means disposed on said positioning plate (**21**) to regulate the stop positions of said tone arm, said protuberance means being arranged to abutt against one of said stopper portions according to the position of said positioning plate selected by said selector lever (**22**), so as to control said actuating means and said operating member;

the improvement in said lead-in system comprising:



(i) having a rotary cylinder (**27**) as part of said actuating means, said rotary cylinder (**27**) supporting said operating member (**30**); a pushing lever (**31**) for controlling said rotary cylinder (**27**) having a rear end at said rotary cylinder and a front end at said cam of the operating means, disposed for longitudinal sliding movement, said pushing lever having a projection (**31*a***) extending from said pushing lever front end; a turning protuberant member (**41**) extending from said cam (**34**) having an arcuate open path (**40**) with a hook end, said pushing member projection (**31*a***) extending to said open path (**40**); engaging means (**31*b***) engaging said projection (**31*a***) to said path (**40**) so disposed that said pushing lever (**31**) is operated only when said protuberant member (**41**) is engaged in the hook end, said engagement being released at a certain turn position of said protuberant member because of the difference in the curve of the arcuate movement of said protuberant member (**41**) and said arcuate open path (**40**).

4,256,311

VIDEO DISC STYLUS RETRACTOR

James A. Allen, Monrovia, and Michael E. Miller, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 3, 1979, Ser. No. 81,485

Int. Cl.³ G11B *3/10*

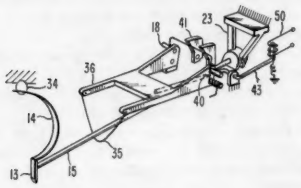
U.S. Cl. 369—170 **11 Claims**

1. In a system for recovering prerecorded information from a disc record, having an information track thereon, by a track-following stylus when said stylus engages said information track and relative stylus/record velocity is established, a combination comprising:

a stylus arm having a generally straight longitudinal axis, said arm having a track-following stylus mounted at a first end thereof, said stylus arm being pivotally supported at a second end thereof permitting engagement of the stylus with said information track;

means for selectively lowering the stylus to the disc record and lifting the stylus from the disc record including a flexible filament of sufficient compliance not to damage

the disc record upon contact therewith, said filament being attached to hang in the form of a catenary from a



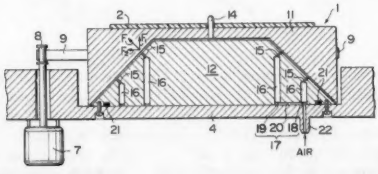
selectively pivoted member and arranged to engage and cradle the stylus arm in proximity to the first end thereof.

4,256,312

TURN TABLE DEVICE FOR RECORD PLAYERS

Makoto Ikeda, Machida, Japan, assignor to R & D Office Makoto Ltd., Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 20,098
Claims priority, application Japan, May 18, 1978, 53/59088
Int. Cl.[3] G11B *3/60*
U.S. Cl. 369—269 **6 Claims**



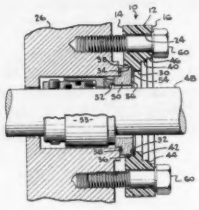
1. An air supported turntable assembly for record players adapted to be used with a record disc having a center hole, said turntable assembly including a rotatable member having a flattened upper surface provided with a center pin to receive the center hole of a record disc, a stationary member placed beneath the rotatable member and having an upper surface facing the lower surface of the rotatable member, means for introducing pressurized air between the rotatable and stationary members to establish a hydrostatic air bearing between the members to float and freely and substantially frictionlessly rotate the rotatable member with record disc thereon, and means for rotating the rotatable member, characterized in that the upper surface of the stationary member is formed of at least a part-conical configuration having a center axis coaxial with the center pin on the rotatable member and an inclination rising from the outer periphery of said upper surface or the vicinity thereof toward the center axis to such an extent that the area of the conical surface becomes substantially larger than the remaining area of said one surface the lower surface of the rotatable member is provided with a recess which is complementary to said part-conical configuration to receive said upper surface of the stationary member in a coaxial manner to gradually increase the mass between the flattened upper surface and the conical recess radially outward so that the moment of inertia of the rotatable member is relatively increased, and said air introducing means comprises a plurality of orifices formed on the inclined surface of the stationary member and located substantially equal distance from each other along the circumference of said inclined surface whereby said rotatable member is substantially frictionlessly supported on said stationary member and can be rotated about the center pin thereon without a rotating center shaft.

4,256,313

UNIVERSAL MECHANICAL SEAL GLAND

William A. Arnold, 15 Long Boat Pl., Savannah, Ga. 31410

Filed Apr. 16, 1980, Ser. No. 142,139
Int. Cl.[3] F16J *15/34*
U.S. Cl. 277—11 **5 Claims**



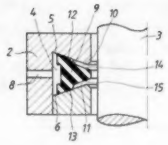
1. The combination of a housing, a rotary shaft mounted for rotation in said housing and extending through an opening in the housing externally thereof, a rotary seal member attached to the rotary shaft for rotation therewith, a universal mechanical seal gland mounted on said housing coaxially over said rotary shaft for positioning a fixed annular seal against said housing and also against said rotary seal member, said seal gland comprising an annular body member formed of plastic and having front and rear parallel planar face surfaces, an aperture extending through said body member concentrically oriented with respect to a main axis perpendicular to said front and rear parallel planar face surfaces, said aperture being defined by a plurality of coaxial cylindrical surfaces of different diameters with adjacent ones of said cylindrical surfaces being connected by planar sealing surfaces oriented perpendicularly to the axis of said coaxial cylindrical surfaces.

4,256,314

SEALING DEVICE FOR TEMPORARY PRESSURE SEALING

Ake Berglund, and Ake Fries, both of Vesteras, Sweden, assignors to AB Asea-Atom, Vesteras, Sweden

Filed Jul. 30, 1979, Ser. No. 61,740
Claims priority, application Sweden, Aug. 14, 1978, 7808599
Int. Cl.[3] F16J *15/16*
U.S. Cl. 277—27 **2 Claims**



1. An improved sealing apparatus for use between a rotatable shaft and a support surrounding said shaft, said apparatus comprising:

an annular slot formed in said support, said slot having an opening at its radially inner edge, said opening facing said shaft; said slot also having annular slot surfaces facing each other and extending to said opening;

an elastomeric sealing ring disposed in said slot, said ring having two radially outwardly located sealing surfaces for sealing against said annular slot surfaces when said ring is forced radially inwardly in said annular slot, through said opening and into contact with said shaft; said ring also having two radially inwardly located surfaces facing said annular slot surfaces, each of said further surfaces being spaced from said annular slot surfaces and said opening

when said sealing surfaces seal against said annular slot surfaces as said ring extends through said opening and contacts said shaft, whereby creep of said ring past the edges of said slot is prevented so that said ring can withdraw into said slot upon release of said ring; and

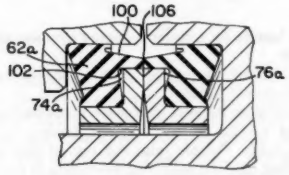
means for forcing said ring radially inwardly wihin said annular slot and into contact with said shaft.

4,256,315

MECHANICAL END FACE SEAL WITH DIRT EXCLUDER LIP

Ellis Larson, Arlington Heights, and Burton K. Olsson, Park Ridge, both of Ill., assignors to CR Industries, Elgin, Ill.

Filed Oct. 22, 1979, Ser. No. 87,239
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—92 **12 Claims**



1. A heavy duty seal unit adapted to cooperate with a sealed mechanism comprising first and second, relatively movable machine parts, said seal being adapted to retain lubricant within said sealed mechanism and to exclude contaminants therefrom, said seal unit comprising, in combination, at least one primary seal ring and a combination secondary seal ring and force-applying element associated therewith, said primary seal ring being formed from a rigid material, being annular and having a generally L-shaped cross-section and including a radial flange and an axial flange, said radial flange having a radially outwardly facing surface, a seal-forming end face comprising at least a part of one radially extending surface of said radial flange and an oppositely directed radially extending surface, said axial flange having a radially outer, axially extending surface, said oppositely directed radial surface of said radial flange and said axially extending outer surface cooperating to define a seat for receiving said secondary seal ring, said secondary seal ring being made from an elastomer, having an annular configuration and including a body portion of generally parallelogram cross-sectional shape with axially extending, radially facing inner and outer end surfaces and first and second inclined body sidewall surfaces lying generally parallel to each other, said body also having an excluder lip portion integrally formed with said body, said lip also having radially inner and outer surfaces, and extending generally axially outwardly from one of said body sidewall surfaces, with a part of said inner lip surface overlying at least a portion of of said radially outwardly facing surface of said radial flange of said primary seal ring so as to seal the region between said radially inner surface of said excluder lip, said oppositely directed radial surface of said primary seal ring and the radially inner part of one of said body sidewall surfaces.

4,256,316

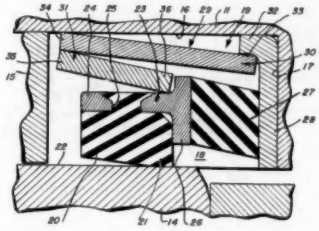
JOINT SEALING STRUCTURE

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00844, § 371 Date Oct. 15, 1979, § 102(e) Date Oct. 15, 1979
This PCT application filed Oct. 15, 1979, Ser. No. 117,582
Int. Cl.³ F16J *15/32, 15/34*
U.S. Cl. 277—92 **23 Claims**

1. In a joint (10) having a first member (11) defining a cylindrical axially outwardly opening recess (18), a second member (14) adjacent said first member and defining a sealing surface (22) confronting said recess, said members being associated to have relative rotational movement about the axis of the recess and relative movement toward and from each other in the direction of said axis, an improved sealing structure (19,119,219) in said recess for movably sealing said members, comprising:

an annular support member having a radially outer connecting portion (27,127,227) received coaxially in said recess formed of a resilient material having high resiliency over a wide temperature range, and a radially inner rigid stiffener portion (23,123,223);



an annular seal (20,120,220) formed of resilient sealing material having high wear and abrasion resistance, said seal having an axially inner portion carried by said stiffener portion, and an axially outer portion defining a sealing lip (21,121,221) sealingly engaging said confronting sealing surface (22); and

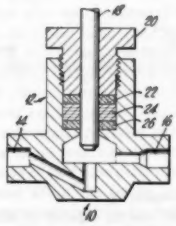
spring means (29,129,229) extending between said first member (11) at the axially outer end (16) of the recess (18) and said stiffener portion (23,123,223) of the support member to urge said lip into maintained movable sealed engagement with said cooperating surface notwithstanding relative axial movement between said members.

4,256,317

HIGH-TEMPERATURE, HIGH-PRESSURE VALVE PACKING SYSTEM

Marvin R. Havens, St. Albans; Donald R. Fields, Cross Lanes, and Douglas J. Miller, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

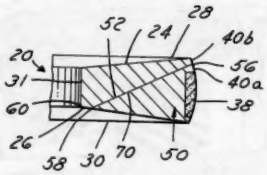
Filed Apr. 24, 1980, Ser. No. 143,334
Int. Cl.³ F16J *15/16*
U.S. Cl. 277—112 **14 Claims**



1. A valve packing system capable of gas-tight sealing of low molecular weight gases at extremes of temperature and pressure comprising, in combination with a valve stem and a valve stuffing box, a compacted body of expanded graphite material having an apparent bulk density from 1.6 to 2.0 times its bulk density prior to compaction and positioned in and formed to contour said stuffing box with substantially zero clearance between each of said valve stem and said valve stuffing box, and a pair of flat baked or graphitized carbon guide and support bearing rings or bushings positioned to retain said compacted body of expanded graphite material therebetween and

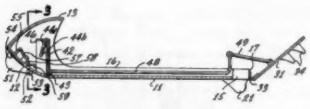
machined to operate in close internal clearance with said valve stem and close external clearance with the internal walls of said stuffing box.

4,256,318
PISTON RING
Jerome J. Bush, Holland, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.
Filed Apr. 28, 1980, Ser. No. 144,676
Int. Cl.³ F16J 9/14
U.S. Cl. 277—221 **9 Claims**



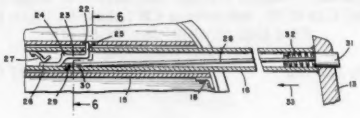
1. A piston ring comprising a parted annular metal body having axial side walls for seating in a ring groove and an outer peripheral surface, a groove extending entirely around said outer peripheral surface and defined in part by axially spaced lands disposed on said surface, a band of wear-resistant material in said groove for sealing engagement with a cylinder wall, said lands being respectively adjacent opposing axial edges of said band, and an overlapping joint construction at the parted ends of the ring comprising opposed planar surfaces extending essentially diagonally of the ring body and inclined at an acute angle relative to the plane of said ring, said surfaces terminating at said outer peripheral surface within one of said lands.

4,256,319
TOBOGGAN
Richard D. Winter, 10237 Park, Bellflower, Calif. 90706
Filed Sep. 11, 1979, Ser. No. 74,491
Int. Cl.³ B62B 15/00, 17/08
U.S. Cl. 280—18 **9 Claims**



1. A toboggan comprising:
a body with a flat bottom capable of sliding on snow and with a curved forward portion;
said body having an aft rail disposed transversely and at the rear end thereof;
a rear stabilizing fin disposed on the underside of said body;
a pair of drag panels hinged at said aft rail of said body and disposed to pivot independently about a transverse axis disposed parallel to said bottom;
each of said drag panels being disposed rearward of said body and having a flat bottom which is capable of being pivoted into the plane of said bottom of said body;
first means disposed on said flat bottom of each of said panels and protruding therefrom; and
second means disposed within said body for independently pivoting each one of said panels about said axis.

4,256,320
PULL HANDLE FOR ROLLER MOUNTED SUITCASES
Robert G. Hager, 219 Aderno Way, Pacific Palisades, Calif. 90272
Filed May 18, 1979, Ser. No. 40,161
Int. Cl.³ B62B 1/12
U.S. Cl. 280—37 **4 Claims**



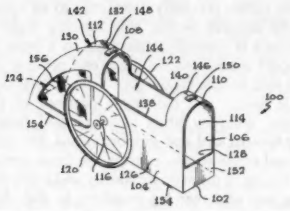
1. A pull handle for a roller mounted suitcase, including, in combination:
(a) an elongated supporting tube of square cross-section secured to said suitcase;
(b) an extension member of square cross-section having a gripping handle on one end and having its other end telescopically slidable into and out of one end of said supporting tube the square cross-section of the supporting and extension member preventing relative rotation therebetween;
(c) cooperating indexing means on said supporting tube and member for holding said member in a given extended telescoped position relative to said supporting tube so that said member is at a sufficient distance from the suitcase for convenient gripping by a user for guiding said roller mounted suitcase along the ground, said cooperating indexing means including a lever element pivotally mounted inside the hollow extension member having one end projecting through an opening in said member towards the surrounding side wall of said supporting tube, a cavity structure in said supporting tube in a position to receive said pin when said extension member is telescopically extended to said given extended telescoped position, and a spring means in said extension member biasing said lever in a manner to urge said pin laterally outwardly;
(d) manual release means operable by a person gripping said handle comprising a slide rod extending from said gripping handle within said extension member to said lever such that manual pushing of said rod end at said gripping handle causes the other end of the slide rod to rock said lever in a direction retracting said pin from said cavity structure in said supporting tube, thereby releasing said extension member and permitting said member to be fully retracted into said supporting tube when not in use.

4,256,321
BICYCLE CAMPER-TRAILER
Chris D. Trulove, 2805 Catherine Way, Santa Ana, Calif. 92705
Filed Jul. 14, 1978, Ser. No. 924,646
Int. Cl.³ B62K 27/02
U.S. Cl. 280—204 **9 Claims**

1. A camper-trailer adapted for use with a two-wheeled vehicle, comprising:
an elongated main body having a bottom, a pair of opposed sides, a front end, and a rear end;
hinge means intermediate said bottom and said sides for permitting the latter to be moved from a normal substantially upright position to a second lower position in which at least a portion of said sides extends in a plane aligned with said bottom;
releasable locking means for maintaining said sides in the first upright position;
a pair of wheels mounted on said sides, whereby upon release of said locking means and displacement of said sides

from said first to said second position, said body may be placed in an upright position, serving as a frame for a tent to be erected; and

wherein said sides define portions extending in parallelism with each other and portions radiused inwardly from said parallel portions toward the center of said body, said radiused portions of said sides each define a cutout formed



therein, and wherein the radiused portions adjacent the cutouts constitute contacting portions coupled to each other and forming a top front and top back of said trailer, wherein said contacting portions extend substantially midway and at the rear of said trailer, and wherein said releasable locking means are in the form of stretch rubber fasteners attached to said contacting portions.

4,256,322

COMBINED CARRYING AND LOCKING DEVICE FOR A CYCLE

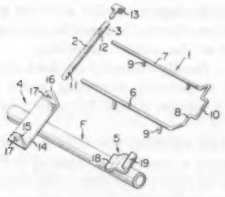
Norimoto Otsuka, Tokyo, and Osanori Godo, Ooi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1979, Ser. No. 46,787

Claims priority, application Japan, Jun. 23, 1978, 53-86250[U]

Int. Cl.[3] B62J *7/02;* E05B *71/00*

U.S. Cl. 280—289 L **3 Claims**



1. A combined carrying and locking device for a cycle having a frame, said device comprising: a bracket means fixed to said frame, a substantially U-shaped carrier body including a pair of parallel spaced legs and a base portion interconnecting said legs; a bar removably receiving said legs, said bar being removably mounted on said bracket means; a supporting member fixed to said frame for removably engaging said base portion when said bar is mounted on said bracket means whereby said carrier body may carry an article to be transported by said cycle; and means disposed within said bar for selectively locking said legs to said bar whereby said carrier body and bar may be removed from said bracket means and used to encircle an element of said cycle in a locked condition.

4,256,323

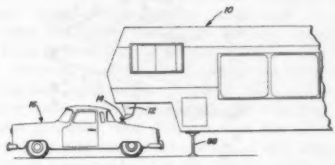
VEHICLE TRUNK MOUNTED FIFTH WHEEL TRAILER HITCH

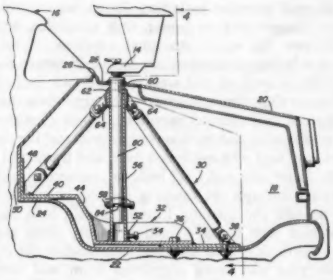
Paul R. McBride, 1970 Table Rock Rd. #3, Medford, Oreg. 97501

Filed Jan. 17, 1979, Ser. No. 4,287

Int. Cl.[3] B62D *53/04*

U.S. Cl. 280—423 R **4 Claims**



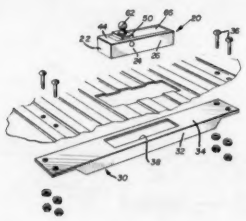


1. In combination with a vehicle body defining a rear rearwardly and upwardly opening storage compartment, having a cover shiftably supported from the body for movement into and out of position closing said compartment and including a stationary body portion defining an upper forward extremity of said compartment spaced above a floor portion of said compartment and disposed immediately to the rear of the lower marginal edge of a rear window of said vehicle, a tow hitch construction including base plate means overlying and anchored relative to said floor portion within said compartment, stationary vertical tubular standard means anchored at its lower end to a central portion of said base plate means, inclined brace means extending and anchored between front and rear opposite side upper portions of said standard means within said compartment and corresponding front and rear opposite side portions of said base plate means at points spaced outwardly from and about the lower end of said standard means, said stationary body portion having an opening formed therethrough upwardly through which the upper end of said standard means projects, and hitch means including a depending stem, said hitch means stem being freely removably downwardly telescoped into standard means, anchor means carried by a lower portion of said standard means within said compartment releasably anchoring said stem in operative position relative to said standard means against lengthwise shifting of said stem relative to said standard means and with said hitch means disposed above said tubular standard means, said hitch means including an enlarged portion overlying and bearing downward on the upper end of said standard means when the latter is anchored in said operative position.

4,256,324
RETRACTABLE TRUCK BED MOUNTED TRAILER HITCH

Carl L. Hamilton, Coffeyville, Kans., assignor to HEC, Incorporated, Kans.

Filed Jul. 3, 1979, Ser. No. 54,464
Int. Cl.³ B62D *53/08*; B60D *1/06*
U.S. Cl. 280—433 **9 Claims**

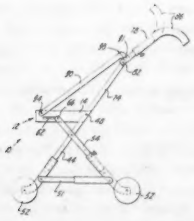


1. In combination, a vehicle including opposite side longitudinal frame rail means, a load bed disposed over and anchored relative to said frame rail means, said load bed including a central opening therein between said frame rail means, an inverted channel member including depending opposite side longitudinal flanges and an upper web extending and connected between the upper marginal portions of said side flanges, said side flanges terminating spaced distances from the opposite terminal ends of said web and said web including an opening formed therethrough centrally intermediate the opposite ends thereof, said channel member extending between said frame rail means with said openings registered and the opposite terminal ends of said web anchored over said frame rail means between the latter and said load bed, an upstanding mounting sleeve secured through the opening formed in said web and extending up into the opening formed in said load bed, said opening in said web being spaced inwardly from said side flanges, the portions of said load bed surrounding the opening therein overlying and being supported from said web, said sleeve defining an upwardly opening recess, a hitch member pivotally mounted in said recess for oscillation between an operative position projecting upwardly from said recess and an inoperative position with a portion of said hitch member substantially flush with the upper end of said mounting sleeve and latch means operatively associated with said hitch member and mount for releasably retaining said hitch member in said operative position.

4,256,325
COLLAPSIBLE FRAMES FOR BABY CARRIERS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Continuation-in-part of Ser. No. 759,081, Jan. 13, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,280
Int. Cl.³ B62B *7/08*
U.S. Cl. 280—649 **26 Claims**

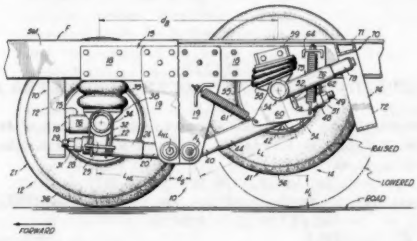


1. A collapsible stroller frame comprising, in combination, seat support means including spaced apart side portions, a rear portion, intermediate portion and front portion, a pair of spaced apart front leg members, rear portions of said spaced apart side portions of said seat support means being pivotally connected to upper portions of said front leg members, a pair of spaced apart rear leg members upper portions of which are slidably engaged by and connected to the spaced apart side portions of said seat support means forwardly of the pivoted connections of said front leg members, handle support means a lower portion of which is connected to said seat support means, handle means pivotally connected to an upper portion of said handle support means, side bracing means one end portion of which is pivotally connected to a front portion of said seat support means and the other end portion of which is connected to said handle means above the pivotal connections of the handle means and the upper portions of the handle support means, whereby upon pivoting said handle means downwardly toward said seat support means, said side bracing means is moved downwardly causing the front portion of said seat support means to pivot downwardly and toward said front leg members, and said rear leg members to slide forward on said seat support means toward the front portion thereof, whereby said rear leg members are lifted under said seat support means and extend in opposite directions from said front leg members.

4,256,326
LIFTABLE TANDEM AXLE SUSPENSION

Ronald T. Cantrell, and Blaine H. Allison, both of Gainesville, Ga., assignors to Allison Mfg., Inc., Gainesville, Ga.

Continuation-in-part of Ser. No. 847,479, Nov. 1, 1977, and a continuation-in-part of Ser. No. 705,146, Jul. 14, 1976, Pat. No. 4,082,305. This application Apr. 4, 1978, Ser. No. 893,505
Int. Cl.³ B60G *5/00*
U.S. Cl. 280—683 **3 Claims**



1. A tandem axle suspension for a trailer mounted on the trailer frame within a limited suspension mounting space adjacent the rear end of the trailer comprising:

a trunion frame fixedly mounted on the trailer frame within the limited suspension mounting space and including spaced apart trunion beams depending below the trailer frame;

a non-liftable axle assembly pivotally mounted on said trunion beams about a generally horizontal first common pivot axis oriented normal to the longitudinal axis of the trailer and extending forwardly of said trunion beams within the limited suspension mounting space; and

a liftable axle assembly pivotally mounted on said trunion beams about a generally horizontal second common pivot axis oriented normal to the longitudinal axis of the trailer and extending rearwardly of said trunion beams within the limited suspension mounting space for operation independently of said non-liftable axle assembly;

said non-liftable axle assembly including a pair of first torque arms pivotally mounted on said trunion beams about the first common pivot axis and extending forwardly thereof within the limited suspension mounting space, each of said first torque arms having a first prescribed effective length, defining a projecting end thereon, and including a threaded stud at the projecting end thereof; a first wheel

and axle assembly; a pair of first seat assemblies one of said first seat assemblies mounted on the projecting end of each of said first torque tubes, said pair of said first seat assemblies mounting said first wheel and axle assembly therebetween so that said axle is generally perpendicular to the longitudinal axis of the trailer, each of said first seat assemblies including a first support tube slidably received on one of said pair of first torque arms for axial movement along said first torque arm; a pair of first internally threaded members, each of said first internally threaded members rotatably connected to, but axially fixed with respect to, said first support tube of one of said first axle seat assemblies and threadedly engaging said stud on said first torque arm mounting said first axle seat assembly so that rotation of said first internally threaded members adjusts the alignment of said first wheel and axle assembly by positively shifting said first axle seat assemblies axially along said first torque arms; and a pair of first air bag springs operatively connecting said first wheel and axle assembly to the trailer frame to spring same;

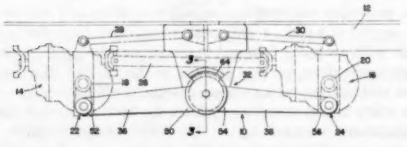
said liftable axle assembly including a pair of second torque arms pivotally mounted on said trunion beams about the second common pivot axis and extending rearwardly thereof within the limited suspension mounting space each of said second torque arms having a second prescribed effective length, greater than the first prescribed effective length of said first torque arms, defining a projecting end thereon, and including a threaded stud at the projecting end thereof; a second wheel and axle assembly; a pair of spaced apart second seat assemblies one of said second seat assemblies mounted on the projecting end of each of said second torque tubes, said pair of said second seat assemblies mounting said first wheel and axle assembly therebetween so that said axle is generally perpendicular to the longitudinal axis of the trailer, each of said second seat assemblies including a second support tube slidably received on one of said pair of second torque arms for axial movement along said second torque arm; a pair of second internally threaded members, each of said second internally threaded members rotatably connected to, but axially fixed with respect to, said second support tube of one of said second axle seat assemblies and threadedly engaging said stud on said second torque arm mounting said second axle seat assembly so that rotation of said second internally threaded members adjusts the alignment of said second wheel and axle assembly by positively shifting said second axle seat assemblies axially along said second torque arms; a pair of second air bag springs operatively connecting said second wheel and axle assembly to the trailer frame to spring same; and lift means for selectively lifting said second wheel and axle assembly out of road engagement when said second air bag springs are deflated.

4,256,327

TORSION TYPE TANDEM SUSPENSION

Robert L. Leinweber, Mentor, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 5, 1979, Ser. No. 9,616
Int. Cl.³ B60G *5/04*
U.S. Cl. 280—684 **2 Claims**



1. A torsion type tandem axle suspension for mounting a first and a second transverse axle in longitudinally spaced manner to a vehicle frame comprising two longitudinally extending, transversely spaced frame members, said suspension comprising:

a bracket mounted to and extending downwardly from each frame member, said brackets located longitudinally intermediate said axles;

a transversely extending container tube rigidly mounted to said frame by said brackets, said container tube defining a generally annular bore at each end thereof;

a rocking beam assembly rotatably received in each end of said container tube, said rocking beam assemblies each comprising a torsion coupling rotatably received in said container tube, a first rocking beam fixed at one end thereof to said torsion coupling and pivotably mounted at the other end thereof to said first axle and a second rocking beam fixed at one end thereof to said torsion coupling and pivotably mounted at the other end thereof to said second axle, said torsion couplings each comprising an annular torsion tube telescopically and rotatably received in said container tube and a torsion bar telescopically received in said torsion tube, each of said torsion tubes having an inner end located adjacent the center line of the vehicle and an outer end extending beyond the outer end of the container tube, said torsions bars each having an inner end fixed to the inner end of the torsion tube at a splined connection and an outer end extending beyond the outer end of the torsion tube, said one end of said first rocking beam fixed to said outer end of torsion rod and said one end of said second rocking beam fixed to the outer end of said torsion tube;

a transversely extending hood member of generally acruate cross-section attached to said container tube, said hood member projecting transversely beyond the outer end of said torsion rod and defining a slot opening toward the axis of said container tube and generally transversely aligned with the end of said torsion rod; and

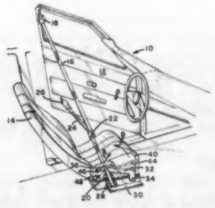
an annular disc adapted to be received in said slot to limit axial movement of said rocking beam assembly relative to said container tube, said annular disc having a generally centrally located aperture therethrough, said disc having a thickness generally equal to the width of said slot and an outer periphery of a radius adapted to be rotatably received in said slot, said outer end of said torsion rod provided with a threaded bore and said suspension additionally comprising headed threaded fasteners adapted to pass through said aperture and be received in said threaded bore to attach said discs to the outer ends of said torsion rods.

4,256,328

AUTOMATIC ARTICULATION DEVICE FOR PASSIVE SEAT BELT SYSTEMS

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Jul. 30, 1979, Ser. No. 62,277
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **16 Claims**



1. A vehicle passive seat belt system comprising:

a seat belt means adapted to be secured about an occupant of

said vehicle when said occupant is seated in a seat adjacent a door of said vehicle, said seat belt means being movable between a first, occupant-restraining position and a second, non-occupant restraining position whereby said occupant is free to ingress to and egress from said vehicle;

retractor means mounted adjacent to one side of said seat, said seat belt means being connected to said retractor means;

lever means pivotable in a first direction for moving said seat belt means between its first and second positions, said lever being pivotably mounted adjacent said retractor means and including means for contacting said seat belt means and

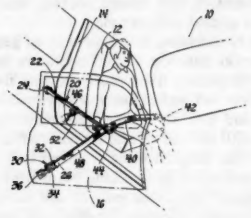
covering means pivotable in a second direction opposite to said first direction, said covering means being located above said retractor means and said lever, said covering means providing protection for said lever and said retractor means when said seat belt means is in its first position.

4,256,329

CHILD RESTRAINT FOR PASSIVE RESTRAINT SYSTEM

James A. Winnale, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1979, Ser. No. 77,949
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **3 Claims**



1. In combination, a vehicle body having a seat located laterally adjacent a door hinged for movement between open and closed positions; a shoulder belt having an outboard end mounted on the upper rear corner of the door and an inboard end; a lap belt having an outboard end and an inboard end; a disconnect buckle adapted to attach the lap belt outboard end on the door and including a first buckle component mounted on the door and a second buckle component mounted on the outboard lap belt end; a retractor means mounted on the vehicle body inboard the occupant seat for winding the lap and shoulder belts to occupant restraining positions when the door is closed and permitting outward and forward movement of the lap and shoulder belts with the door to an occupant access position when the door is opened; and a third buckle component mounted on the vehicle body outboard the seat and generally adjacent the door-mounted first buckle component for selective coupling with the belt-mounted second buckle component to adapt the restraint system for restraint of a child or a child seat.

4,256,330

PASSIVE SEAT BELT SYSTEM

James E. Geoffrey, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

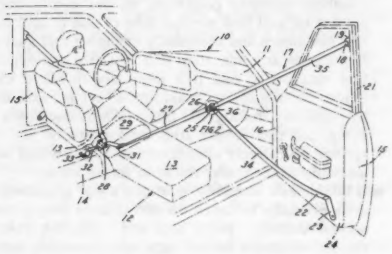
Filed Dec. 20, 1979, Ser. No. 105,825
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **4 Claims**

1. A passive seat belt system having a belt anchored to a hinged vehicle door at upper and lower anchorage points and a strap extending from an inboard retractor mechanism to a slip ring slidable along the belt.

in door closed position, the portions of the belt between the slip ring and the lower anchorage point and the slip ring and the upper anchorage point forming a lap belt segment and a torso belt segment, respectively, for restraining a seat occupant on a vehicle seat,

wherein the improvement comprises a fixed web stop located on the lap belt segment and sized to prevent its passage through the slip ring,

upon engagement of the web stop with the slip ring after predetermined opening movement of the door, the effective length of the torso belt segment becoming fixed and causing the torso segment and retractor strap to be placed under tension as additional strap is drawn from the retractor mechanism as the door is moved to fully opened position,



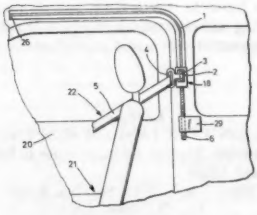
the tension on the retractor strap and torso segment causing the two to seek a straight line relationship and the retractor strap and belt segments to be lifted upwardly and forwardly of the occupant seating position.

4,256,331

PASSIVE SAFETY BELT ARRANGEMENT FOR VEHICLES

Wilfried Schwanz, Ahnsen, and Ulrich Seiffert, Brunswick, both of Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,191
Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821151
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **4 Claims**



1. A passive safety belt arrangement for vehicles, for example, passenger automobiles, including a safety belt articulately connected to a slide; a slide-positioning device for shifting the slide within a guide fastened to the frame of the vehicle in the region of a door opening located in the vicinity of a vehicle seat, said shifting taking place between an off position in which the safety belt is raised away from the body of a passenger in said seat and a restraining position which brings the safety belt in contact with the passenger's body roughly at the height of his shoulders, within the range of the restraining position the guide runs essentially vertically along a doorpost; and a locking mechanism that, when the belt is in the restraining position,

secures the slide against motion that would release it from that position, characterized in that:

the slide-positioning device comprises a flexible rack made of a cable surrounded by a cover located over most of its longitudinal extent, an end of said cable being free of the cover so as to accomodate the slide in slidable fashion on that end; and

said locking mechanism comprises a swiveling locking pawl acted upon by a spring so as to urge it in the direction of engagement with said slide, said locking pawl having a cam-like projection which rests against the end of the cable which is free of the cover whenever the slide is in the restraining position, said projection being acted on by the cover of said slide-positioning device so as to swivel the locking pawl out of engagement with said slide upon movement of the flexible rack.

4,256,332

PASSIVE VEHICLE PASSENGER RESTRAINT SYSTEM

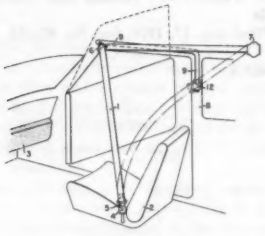
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Jun. 4, 1979, Ser. No. 45,173

Claims priority, application Japan, Aug. 1, 1978, 53-093135

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **6 Claims**



1. A passive vehicle occupant restraint belt system comprising a shoulder belt leading from an inboard location adjacent the lower rear portion of the seat to an outboard location where it is connected to the vehicle body; a guide rail extending along the edge of the vehicle roof above the door from adjacent the front post to the center post and thence partway down the center post; a belt guide ring movable along the guide rail between a restraint location partway down the center post and a release location adjacent the front post and receiving a portion of the belt; a transfer wire coupled to the guide ring and adapted to be driven to move the guide ring between the restraint and release locations; and a stop-anchor affixed to the center post at the restraint location of the guide ring and including a portion which is engageable with one of the guide ring and the belt to hold the belt against pulling forces generated in the belt by a restrained occupant upon an abrupt change in the velocity of the vehicle, the stop-anchor being a metal plate having a notch in its upper edge which receives a portion of the belt guide ring and portions on either side of the notch that overlie and engage portions of the guide rail.

4,256,333

SOLVENT-BONDED JOINT

Eugene C. Jones, Laguna Niguel, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

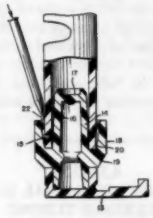
Division of Ser. No. 776,430, Mar. 10, 1977, Pat. No. 4,137,117.

This application Jul. 13, 1978, Ser. No. 924,442

Int. Cl.³ F16L *13/10*

U.S. Cl. 285—22 **4 Claims**

1. In combination, a pair of flexible plastic tubular members frictionally joined directly together along a fluid-tight zone of interference with an elongated gradually-tapered crevice between said members extending towards said zone, said members including an outer member and an inner member, said outer member having an end portion telescopingly receiving an end portion of said inner member, said zone of interference being disposed adjacent the end portion of said inner member, said outer tubular member having an integral tubular insert portion disposed within said inner member, said insert portion frictionally engaging the inner surface of said inner member to form a second fluid-tight zone of interference and bracing said inner member against inward flexure in response to inward



forces exerted upon said inner member by said outer member at said first zone of interference, said tapered crevice between said members being adapted to receive liquid solvent for forming a solvent bond, at least one of said flexible plastic members being provided with a plurality of circumferentially-spaced integral nubs disposed within said crevice adjacent the mouth thereof and engaging the other of said members for maintaining a generally uniform annular spacing between said members at the mouth of said crevice.

4,256,334

UNION FOR TUBES HAVING A SMOOTH END

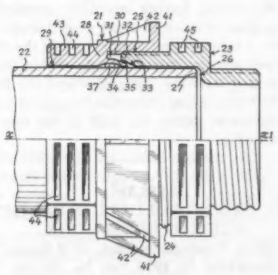
Michel L. Boisset, Le Creux Guillien, Beauregard, 01480 Jassans Riottier, and Louis P. Martelli, Villa Jac-Her-Sy, Lotissement La Manet, 83400 Hyeres, both of France

Filed Aug. 15, 1979, Ser. No. 66,641

Claims priority, application France, Sep. 5, 1978, 78 25976

Int. Cl.³ F16L *19/00, 33/20*

U.S. Cl. 285—247 **12 Claims**



1. A tube union capable of hermetically connecting a smooth end of a tube on the flared end of a connecting piece which comprises mechanical assembing means which cooperate with assembling means carried by the front end of said union, which union comprises a body having two axially opposite ends, a rear end which has a first axial bore passing through it, said bore having a diameter very slightly greater than the outer diameter of said tube, so that said smooth end may be engaged in said bore, and a front end which has a second axial bore passing therethrough, of which the diameter is clearly greater than the outer diameter of said tube, so that, when said smooth end is engaged in the body of the union, it determines with this second bore an annular cavity in which penetrates said flared

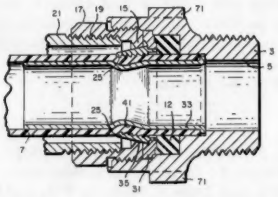
end of the connecting piece, which union body further comprises an anchoring and sealing ring which is constituted by an annular lip, which lip is located in said annular cavity, is incorporated in the body of the union to which it is connected by its rear end which surrounds the front end of the first bore and presents, in its rear part, at least one peripheral recess which extends all around the rear end of the said annular lip and which recess is effective to facilitate the flexion of said lip towards the axis from said recess, said lip having a free forward end and a beveled surface extending from a front edge of said forward end, the bevel angle of said beveled surface being selected in relation to the bevel angle of the flared end of the connecting piece such that when in use, the flared end of the connecting piece engages said beveled surface of the lip to flex same toward said axis and thereby forcibly urge said front edge into the material of the tube and form therewith, without cutting the tube, an annular bead that anchors and seals the tube thereat.

4,256,335

POSITIVE LOCKING TERMINAL BUSHINGS FOR FLEXIBLE TUBING

Anker J. Nielsen, Jr., 410 Bailey Rd., Holden, Mass. 01520

Continuation of Ser. No. 799,211, May 23, 1977, abandoned.
This application Aug. 4, 1978, Ser. No. 930,930
Int. Cl.³ F16L *33/18*
U.S. Cl. 285—250 **1 Claim**



1. Means for joining flexible tubing to rigid piping having in combination a sleeve to enter the tubing and having a peripheral groove with sidewalls of unequal slope and hence deeper at one of its ends than at the other, a body to receive within itself the end of the tubing and the sleeve, a ferrule in the body to surround the tubing having internally serrated segmental walls and a conical exterior, a rigid pipe through which the tubing extends, a bushing on the pipe to fold the ferrule walls inward, a gasket surrounding the tubing within the body, and a compression ring between the gasket and the ferrule to be engaged by the bushing and compress the gasket and force the ferrule to contract to crimp the wall of the tubing into the groove of the sleeve.

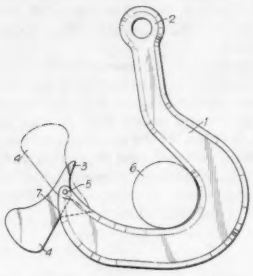
4,256,336

HOOK FOR LIFTING ROLLERS, IN PARTICULAR, A REELING DRUM HOOK

Kare E. Halvorsen, Prestegardsjordet, 3070 Sande, Norway

Filed Oct. 11, 1979, Ser. No. 83,740
Claims priority, application Norway, Oct. 17, 1978, 783507
Int. Cl.³ B66C *1/34*
U.S. Cl. 294—82 R **4 Claims**

1. A hook for lifting rollers comprising: a main hooked body having a tip; and an auxiliary body which is pivotally mounted on the tip of said main body, one end of said auxiliary body being formed as an extension of the tip and the other end thereof as a weight, the pivot connection between the main body and the auxiliary body being arranged at the tip of the main body and between the two ends of the auxiliary body, and the outward movement of said one end of said auxiliary body being restricted by abutment of said other end thereof against the main body, and wherein said one end of said auxiliary body is located on the inward side of a vertical line through said pivot connection; and said other end is on the outward side of said line, and said auxiliary body has an uppermost side which extends from said one end to said other end and generally



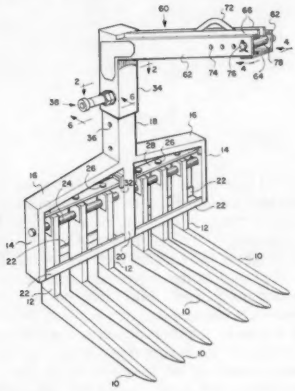
slants downward and outward with respect to said tip when said auxiliary body is at rest.

4,256,337

UNIVERSAL FORK ASSEMBLY

Joachim H. R. Wappler, 317 Kenollie Rd., Mississauga, Ontario, Canada

Filed Aug. 17, 1979, Ser. No. 67,381
Int. Cl.³ B67C *1/00*
U.S. Cl. 294—67 A **9 Claims**



1. A universal fork assembly, for lifting a load of product, said fork assembly comprising;

frame means having side members and at least one cross member joining the same into a generally C-shaped structure;

tine members, mounted in spaced apart location for insertion under said load, said tine members mounted between said side frame means in spaced apart location, and being movable relative thereto, and relative to one another, to provide a different spacing between said tine members;

guide bar means extending across said frame means between said side members for guiding and restraining said tine members;

a column member extending upwardly from said frame means, said column means being extendible and retractable whereby to vary its length;

fastening means in said column whereby to secure the same at a predetermined adjusted length;

a balance bar connected to the upper end of said column means, and extending outwardly therefrom to one side thereof over said tine members, and,

adjustable hoist attachment means on said balance bar, and

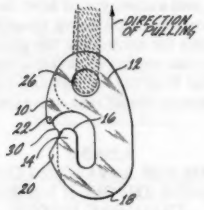
having locking means, whereby the same may be locked in a predetermined adjusted position, whereby to center said fastening means over a load supported on said tine members.

4,256,338

ANTI-SNAG HOOK

Richard E. McLennan, 27019 Grayslake Rd., Rancho Palos Verdes, Calif. 93013

Filed Aug. 6, 1979, Ser. No. 64,043
Int. Cl.³ B66C *1/34*; A44B *1/18*
U.S. Cl. 294—82 R **4 Claims**



1. In a hook of the type having at one end a shank portion by which the hook is normally pulled in a longitudinal direction, having at the other end a reverse portion extending in the direction of pulling and terminating in a tip, and having a mid portion extending laterally to one side of the reverse portion and connecting the shank and the reverse portion, the improvement comprising:

a protrusion extending from the shank portion and spaced from the reversed portion, said protrusion extending longitudinally in a direction opposite the direction of pulling and terminating in an end portion located laterally on the opposite side of the reverse portion from the mid portion, said end portion and said tip of said reverse portion defining a space therebetween; and

a protrusion extending laterally from the reverse portion on the side of the reverse portion away from the mid portion and terminating in an end portion, whereby said end portion of said protrusion of said shank portion is in alignment with said end portion of said protrusion extending laterally from said reverse portion along an axis parallel to the direction of pulling, such that said space opens generally in the opposite direction that said hook is being pulled.

4,256,339

VELOCITY RESPONSIVE DEFLECTOR BLADE WITH SELF-ALIGNMENT PIVOTAL MOUNTING

Charles E. Ingram, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 848,402, Nov. 4, 1977, Pat. No. 4,179,154, and Ser. No. 884,009, Mar. 6, 1978, Pat. No. 4,170,377. This application Apr. 25, 1979, Ser. No. 33,048
Int. Cl.³ B62D *37/02*
U.S. Cl. 296—1 S **7 Claims**

1. A velocity responsive deflector blade assembly comprising:

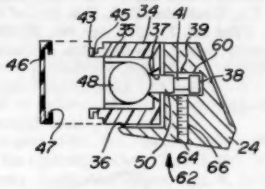
(a) a deflector blade,

(b) a mounting assembly for each end of the blade, each assembly comprising:

(1) a blade cap, the end of the deflector blade being journalled thereonto, said blade cap having a slot formed therein, the end of the blade being journalled into the slot and frictionally retained therewithin;

(2) a casting having means defining a ledge, the blade cap normally seating on the ledge; and

(3) means for self alignigly and pivotally mounting the blade cap to the casting, and



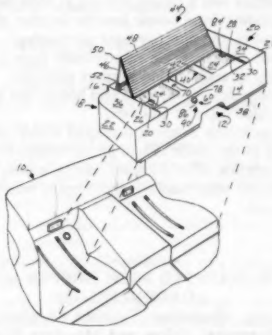
wherein the blade cap pivotally rotates about the pivotal mounting means relative to the casting in response to the velocity of air impinging against the deflector blade.

4,256,340

LOCKABLE STORAGE COMPARTMENT AND SEAT FOR VEHICLES

Richard S. Dunchock, Farmington Hills, Mich., assignor to SL Container Corporation, Southfield, Mich.

Filed Jun. 25, 1979, Ser. No. 52,024
Int. Cl.³ B60P *3/05*
U.S. Cl. 296—24 R **4 Claims**



4. A storage compartment cover and seat comprising:

a pair of panels joined together by a first hinge, the panels movable between a first position wherein they extend from a front wall to a rear wall and between end walls of the compartment enclosing the compartment and forming a seat, to a second position where the panels are hinged together opening the compartment;

a rear transverse edge of the panels hinged to a top edge of the rear wall;

a pair of opposed rods projecting transversely outward from a forward edge of the panels to engage tracks formed in the side walls, the rods slidable along the tracks;

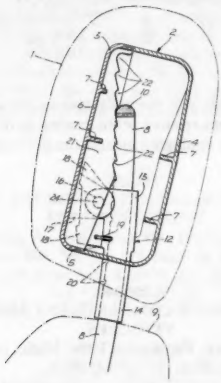
a torsion spring affixed to the first hinge, said spring biasing the panels to the second position; and

a lock means for locking the panels in the first position, said lock means including a downward extnding hinged lock bar hinged to one of the panels and biased to engage a latch of the lock when the panels are moved to the first position, said latch hinging against the bias to clear the adjacent panel when the cover is moved to the second position.

4,256,341
HEAD SUPPORT FOR VEHICLE SEATS

Walter Göldner, Ebersbach, and Werner Strien, Stuttgart-Heumaden, both of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Kirchheim, Teck, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,959
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 7824813[U]; Apr. 3, 1979, 7909580[U]
Int. Cl.³ A47C 1/10
U.S. Cl. 297—410 **18 Claims**

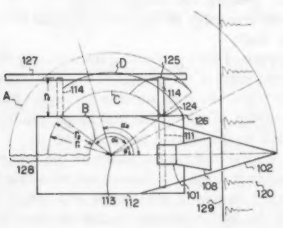


1. In a head support for a vehicle seat including a padded support member and a holder having at least one bar-shaped support extending from below into the interior of said padded support member, the improvement comprising:
- at least one rib extending substantially from top to bottom interiorly of said padded support member,
- said rib being located between said holder and a front wall of said padded support member,
- said rib including notches arranged along its length and opening to the inside of said padded support member, and
- an upper portion of said holder having means for engaging said notches when said padded support member is pivoted to the rear.

4,256,342
DRAGLINE EQUIPPED WITH HOPPER MEANS AND LOADING MEANS

Masaaki Kubo, Musashino; Yasutaka Onodera, Kawaguchi; Hiroshi Kawaguchi, Tokyo, and Masaharu Sibata, Kawaguchi, all of Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,815
Claims priority, application Japan, Jul. 1, 1978, 53-79255
Int. Cl.³ E02F 7/00
U.S. Cl. 299—7 **14 Claims**

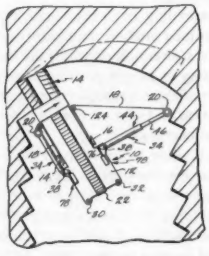


1. A dragline comprising a mobile base, a revolving frame rotatably mounted on the mobile base, a bucket for digging and scooping rocks and stones, soil and sand, minerals and the like therein, a boom mounted on the revolving frame for suspending the bucket therefrom, a hoist rope means passed around the forward end of the boom and connected with the bucket for suspending the latter for vertical movement, a drag rope means for pulling the bucket toward the revolving frame to excavate the material to be dug and scoop it into the bucket, a hooper means mounted on the front portion of said revolving frame for receiving said excavated material, a guide means for guiding said bucket to a position over the hopper means so that the excavated material is loaded into the hopper means by pulling said drag rope means to lift the bucket, and a loading means disposed below said hopper means for receiving and transferring the material into a conveyor, at least the downstream end portion of the loading means being pivotable and provided with control means for controlling the pivotal movement of said downstream end portion so that the center of fall of the excavated material from the downstream end portion lies on the longitudinal center line of said conveyor.

4,256,343
MECHANISM FOR ADVANCING CONTINUOUS MINING MACHINE THROUGH MINING CYCLE AND TRAMMING MODES

Sigmund Black, Beckley; Joseph V. Lagowski, Mabscott; Jerry C. Whitt, Beckley, and Roger D. Plumley, Crab Orchard, all of W. Va., assignors to Fairchild Incorporated, Beckley, W. Va.

Filed May 16, 1979, Ser. No. 39,744
Int. Cl.³ E21C 29/02; E21D 23/24
U.S. Cl. 299—31 **11 Claims**



11. A continuous mining machine for removing coal from a coal seam having a shortwall face extending from a side wall defining one end thereof to another side wall defining the other end thereof, said machine comprising:
- an elongated frame,
- power driven cutting and conveying means carried by said frame in forwardly disposed relation thereto and operable during relative movement of said frame with respect to said face to cut a room section in the coal seam inwardly of the face thereof while continuously conveying the cut coal outwardly of the face,
- conveyor means operatively associated with said frame for continuously moving the coal rearwardly away from the mine face which is cut and conveyed outwardly of the mine face during the formation of said room section by said cutting and conveying means, and
- means for moving said frame and said cutting and conveying means forwardly and transversely to effect the formation of said room section, said means including an arm mounted on each side of said frame for pivotal movement about a generally vertically extending axis, a longitudinally telescoping structure carried by each arm and extending longitudinally therefrom and a vertically extendable and retractable mine floor to mine roof anchoring

jack assembly mounted on the outer end portion of said telescoping structure and power operated means for pivoting each of said arms about its vertical axis and power operated means for effecting a longitudinal telescoping movement of each of said telescoping structures.

4,256,344

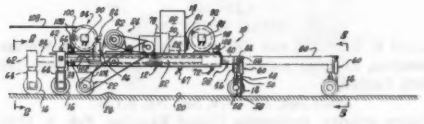
CONCRETE SURFACING MACHINE

Cecil W. Hatcher, West Covina, Calif., assignor to Concrete Safety Equipment, Inc., Torrance, Calif.

Filed Dec. 18, 1978, Ser. No. 970,525

Int. Cl.³ E01C *23/09*

U.S. Cl. 299—39 **18 Claims**



1. A concrete surfacing machine comprising:

a carriage including a frame, wheels at each end of said frame supporting said carriage for movement along a concrete surface to be worked,

said frame including longitudinally telescoping portions at each end mounting said wheels for relative adjustment of said wheels lengthwise of said frame to vary said wheel spacing,

adjusting means comprising means for relatively extending and contracting said frame portions, to adjust the wheels at each end of said frame lengthwise of said frame, and

concrete surfacing means mounted on said frame between said wheels.

4,256,345

SCRAPER CHAIN CONVEYOR WITH RACK FOR THE CHAINLESS FEED OF WINNING MACHINES

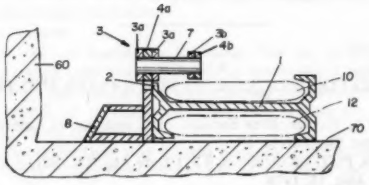
Karl-Heinz Schwarting, Voerde, and Roland Guenther, Wesel, both of Fed. Rep. of Germany, assignors to Gutehoffnungshütte Sterkrade AG, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,650

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850187

Int. Cl.³ E21C *35/20*

U.S. Cl. 299—43 **5 Claims**



1. A chain conveyor section of a longwall conveying device for underground mining of a longwall using a winning machine riding on the conveying device comprising: a trough member defining a trough adapted to receive a scraper chain therein, the trough member having one flanged side wall and one unflanged side wall positionable next to the longwall, a main rack section connected to said unflanged side wall extending over said trough and toward said flanged side wall for holding one end of the scraper in the trough, and an intermediate rack segment pivotally connected to said main rack segment for interconnecting at least the unflanged side wall sides of adjacent chain conveyor sections of the conveying device said rack sections having passages through said sections to permit passage of mined material into the conveying run of the scraper conveyor to prevent caking of the material between said rack sections and the drive means on the winning machine.

4,256,346

WHEELS FOR VEHICLES, SUCH AS MOTORCYCLES

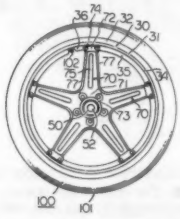
Takeshi Kawaguchi; Yasuhisa Kobayashi, and Masayuki Onimaru, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 784,053, Apr. 4, 1977, Pat. No. 4,181,365. This application Oct. 17, 1978, Ser. No. 952,096

Claims priority, application Japan, Apr. 8, 1976, 51-43487; May 1, 1976, 51-55235; Jun. 25, 1976, 51-83689; Jul. 7, 1976, 51-80602

Int. Cl.³ B60B *1/10*

U.S. Cl. 301—64 SH **10 Claims**



1. A wheel for a vehicle, comprising:

a wheel hub;

a wheel rim having at least one projection on the inner surface thereof;

a plurality of pairs of oppositely-disposed spokes which are mechanically and operably connected to said wheel hub and said rim projection;

one spoke of each said pair of spokes being connected adjacent one side of said wheel hub, and the other spoke of each said pair of spokes being connected adjacent the opposite side of said wheel hub;

said wheel hub and each of said pairs of spokes forming in a vertical cross-section a first triangle having the apex thereof defined at the connection of said spokes to said rim projection;

each said spoke of each said pair of spokes extending in the radial direction of said wheel and being connected to said wheel hub at intermediate connecting portions between adjacent ones, in the circumferential direction, of said radially extending spokes;

each said intermediate connecting portion being disposed on a line extending from opposite side edges of adjacent ones of said radially-extending spokes, said line defining the line of action of a load on said wheel; and

each said intermediate connecting portion forming the apex of a second triangle defined by opposite side edges of adjacent radially extending spokes and a portion of said wheel rim.

4,256,347

SPOKED WHEEL

Merlyn R. Reppert, 28045 Palos Verdes Dr. E., Rancho Palos Verdes, Calif. 90274

Filed Oct. 18, 1979, Ser. No. 86,261

Int. Cl.³ B60B *1/10*

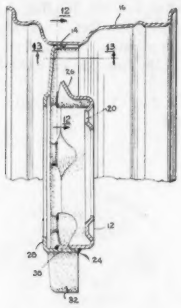
U.S. Cl. 301—64 SH **4 Claims**

1. A wheel center comprising:

(a) an annular hub having an upright wall with wheel-mounting means thereon for mounting the wheel to a

vehicle and with an annular wall on the front face of the hub extending generally at a right angle to the upright wall, said annular wall having a substantially annular base portion with finger portions protruding upwardly and outwardly therefrom at spaced intervals;

(b) a spider having a plurality of spoke sections extending radially outwardly at spaced intervals from an annular base wall portion, each of said spoke sections being three-sided with a front face and two rearwardly extending side walls in a channel-like configuration; and



(c) the hub being assembled to the spider with the front face of the hub facing the rear of the spider, with each of said finger portions extending upwardly toward and welded within a respective spoke section of the spider, and with the top face of the annular base portion of the hub in juxtaposition with and welded to the underside of the base wall portion of the spider whereby the finger portions of the hub are interlocked to the spoked sections of the spider with the base portion of the hub underlying and locked to the base wall portion of the spider.

4,256,348

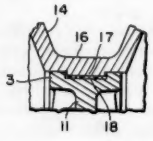
ALUMINUM ALLOY MOTORCYCLE WHEEL HAVING AN EXTRUDED RIM SHRINK FITTED AND RESIN BONDED TO A DIE CAST HUB-SPOKE UNIT

Thomas J. Lester, Beachwood, and Theodore C. Ptacek, Northfield, both of Ohio, assignors to Lester Industries, Inc., Bedford, Ohio

Continuation of Ser. No. 842,586, Oct. 17, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,591

Int. Cl.³ B60B *1/08, 23/00*

U.S. Cl. 301—64 R **2 Claims**



1. A lightweight wheel comprising a die cast aluminum alloy hub-spoke unit having a central hub portion and an outer circular ring portion integrally connected together in coaxial relation by radially extending spokes; and an extruded aluminum alloy drop center rim having an inside diameter which is a shrink fit around widely spaced axial ends of the outside diameter of said ring portion to retain said rim and hub portion in coaxial relation and to preclude relative axial and rotary movement of said rim and unit by axial and torque loads on said wheel; said rim and ring portion between said axial ends having concentric radially spaced apart cylindrical surfaces which define a radially thin and axially wide annular chamber between said axial ends; and a thermosetting resin adhesive bonded to and confined under pressure in said annular chamber additionally to lock said rim and hub-spoke unit together; the cylindrical surface of said ring portion being defined by a peripheral groove between said axial ends; and the cylindrical surface of said rim being defined by a locating rib thereof which is of axial width slightly less than that of said peripheral groove and which, solely as the result of shrinkfitting of said rim around said ring portion, extends radially inwardly into said peripheral groove to axially lock said rim with respect to said ring portion and to radially squeeze said adhesive between said cylindrical surfaces thus to confine said adhesive under pressure in said annular chamber.

4,256,349

ROAD WHEELS

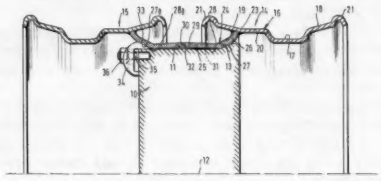
Michael F. Edwards, and Edward Williams, both of Wolverhampton, England, assignors to GKN Sankey Limited, Telford, England

Filed Jan. 31, 1979, Ser. No. 8,128

Claims priority, application United Kingdom, Feb. 1, 1978, 4019/78; May 23, 1978, 21676/78

Int. Cl.³ B60B *11/06*

U.S. Cl. 301—13 SM **5 Claims**



1. A demountable rim assembly comprising a rim, an adaptor band having opposite circumferential edges, a weld between one of said edges and the rim, the band extending from said weld axially of the assembly well beyond the rim and to the other of said edges, the band having, adjacent to said weld, an internal divergent machined surface and adjacent to said other edge a cylindrical portion which projects axially beyond the rim and has an internal cylindrical machined surface, the cylindrical portion being apertured to receive clamping means, said surfaces being true about the rotary axis of the assembly having been machined after welding of the band to the rim, said other edge being constituted by a machined surface which lies in a plane perpendicular to said rotary axis.

4,256,350

FLUID CONTROL CIRCUIT FOR BRAKES AND THE LIKE

Wayne A. Hoefer, Blue Springs, Mo., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00598, § 371 Date Aug. 13, 1981, § 102(e) Date Aug. 13, 1979

This PCT application filed Aug. 13, 1979, Ser. No. 118,034

Claims priority, application 08131979, Aug. 13, 1979, US79/00598

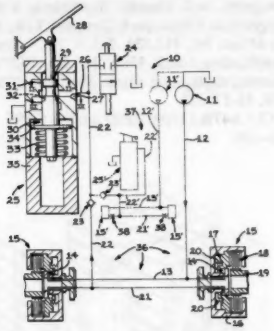
Int. Cl.³ B60T *13/00*

U.S. Cl. 303—6 M **19 Claims**

1. In a fluid control circuit (**10**) comprising pump means (**11**) for discharging pressurized fluid therefrom, fluid-actuated coupling means (**15**), having an actuating chamber (**14**), for being selectively placed in a disengaged or engaged condition of operation, and valve means (**25**) for selectively controlling the engagement of said coupling means (**15**), the improvement comprising

means (**36**) for continuously communicating fluid from said

pump means (11), through the chamber (14) of said coupling means (15), and to said valve means (25) in series



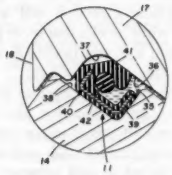
when said coupling means (15) is in both its disengaged and engaged conditions of operation.

4,256,351

SEALING SYSTEM FOR A ROLLING CONE CUTTER EARTH BORING BIT

James W. Langford, Jr., Red Oak, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 24, 1978, Ser. No. 963,630
Int. Cl.[2] F16C *33/72*
U.S. Cl. 308—8.2 **2 Claims**



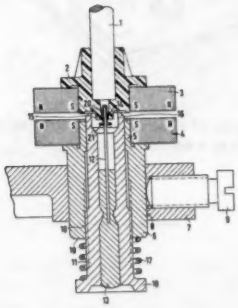
1. An earth boring bit for operation in an abrasive borehole environment, comprising:
- a bit body;
- at least one bearing pin extending from said bit body;
- a rolling cone cutter mounted to rotate about said bearing pin, said rolling cone cutter having an open cone mouth;
- a lubricant maintained between said bearing pin and said rolling cone cutter;
- an annular rigid ring located between said bearing pin and said rolling cone cutter with an elastomer connected to said annular rigid ring, said annular rigid ring with an elastomer being located in said open cone mouth and affixed to said rolling cone cutter by an interference fit so that said annular rigid ring will rotate with said rolling cone cutter;
- an elastomer sealing ring attached to said annular rigid ring, said elastomer sealing ring having a protruding lip with a wiping surface that extends toward said bearing pin and contacts said bearing pin thereby sealing said lubricant from said abrasive borehole environment; and
- an elastomeric constricting ring positioned around said protruding lip that maintains said wiping surface of said elastomeric sealing ring in contact with said bearing pin.

4,256,352

NEEDLE JOURNAL BEARING FOR A MAGNETICALLY SUPPORTED ROTOR SHAFT OF A MEASURING INSTRUMENT

Heinz Petrak; Gunther Vieweg, and Martin Weinicke, all of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 8,039
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1978, 2807339
Int. Cl.[3] F16C *39/06*
U.S. Cl. 308—10 **7 Claims**



1. A needle journal bearing for a magnetically supported rotor shaft of a measuring instrument, such as a watt-hour meter, comprising a thin metal bearing needle protruding into a needle guide made of polyoxymethylene, the bearing needle being provided, at least in the region interacting with the needle guide, with a covering in the form of a sleeve of polyamide which is slipped onto the needle.

6. A needle journal bearing for a magnetically supported rotor shaft of a measuring instrument comprising:
- a thin metal bearing needle supported in a needle bushing;
- a collar extending concentrically around the needle from an endface of the bushing;
- a replaceable plastic sleeve covering the needle and protruding therewith into a needle guide made of plastic, the plastics of the sleeve and the needle guide being chosen to provide low friction and wear between the respective surfaces in sliding engagement;
- the needle guide comprising a hole in a cylindrical extension of a plastic hub fastened to the end of the rotor shaft and to a concentric ring magnet and the cylindrical extension protruding into the collar on the endface of the needle bushing; and
- a collar spaced apart from the needle guide on the replaceable plastic sleeve.

4,256,353

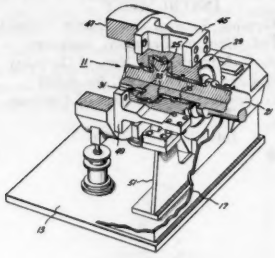
SELF-ALIGNING BEARING

George A. Fischer, and Melvin A. Prohl, both of Boxford, Mass., assignors to General Electric Company, Lynn, Mass.

Filed May 18, 1979, Ser. No. 40,163
Int. Cl.[3] F16C *23/04, 27/02, 35/02*
U.S. Cl. 308—26 **9 Claims**

1. A self-aligning bearing structure for supporting a rotor comprising:
- a bearing casing;
- a yoke positioned at one end of the bearing casing and substantially aligned with the rotor axis of rotation;

a first pair of axially directed strut members connecting the bearing casing to the yoke; and,



a second pair of axially directed strut members connecting the yoke to a support structure.

4,256,354

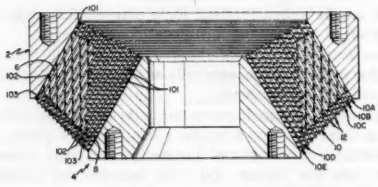
LAMINATED BEARING STRUCTURES

Robert R. Peterson, Hudson, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 17,823, Mar. 5, 1979. This application Aug. 20, 1979, Ser. No. 67,993

Int. Cl.³ F16C *27/08, 17/10*

U.S. Cl. 308—139 **8 Claims**



1. In a laminated bearing comprising a plurality of alternating and bonded together layers of elastomeric material and substantially non-extensible material with the layers disposed about and alternating lengthwise of a common axis so as to permit the bearing to support compressional loads applied generally normal to the layers and torsional loads applied about said axis, each layer having with respect to said axis a radially inner circumference and a radially outer circumference, the improvement wherein at least two of said layers of elastomeric material are characterized by a first portion thereof at said inner circumference having a first relatively high nominal modulus of elasticity, a second portion thereof at said outer circumference having a second nominal modulus of elasticity smaller than said first modulus of elasticity, and a third portion thereof between said first and second portions having a third nominal modulus of elasticity less than said second nominal modulus of elasticity, the differences between said nominal moduli of elasticity being such that the shear strain distribution in each of said plurality of layers under compressive load is more uniform than the shear strain distribution in said each layer if said each layer were formed so as to have a constant nominal modulus of elasticity throughout, and each of said second portions having a modulus of elasticity sufficiently high for it to serve as a dam against bulging.

4,256,355

LOCKING AND UNLOCKING DEVICE FOR MANUALLY MOVABLE WHEELED STORAGE RACK OR THE LIKE

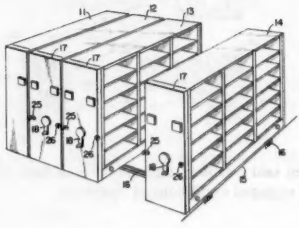
Tsuneo Yamaguchi, and Kiyoshi Harashima, both of Tokyo, Japan, assignors to Elecompack Company Ltd., Tokyo, Japan

Continuation of Ser. No. 812,634, Jul. 5, 1977, abandoned. This application Jul. 2, 1979, Ser. No. 53,976

Claims priority, application Japan, Dec. 22, 1976, 51-172057; Dec. 24, 1976, 51-173323

Int. Cl.³ A47B *53/00;* **F16D** *63/00;* **G05G** *1/00*

U.S. Cl. 312—198 **5 Claims**



1. In combination with at least one movable storage rack having a driving mechanism for moving said rack in opposite directions;

a locking and unlocking mechanism for said rack comprising

a rotatable toothed locking wheel drivingly connected with said driving mechanism;

a first engaging means on one side of said wheel including a first catch member pivotally mounted at one end about a first axis to move under gravity into a first position in engagement with said wheel to prevent rotation of said wheel in one direction while permitting rotation of said wheel in an opposite direction and a second position spaced from said wheel, and a first lever member pivotally mounted about said axis and having a slot with said first catch member passing therethrough;

second engaging means on an opposite side of said wheel including a second catch member pivotally mounted at one end about a second axis to move under gravity into a first position in engagement with said wheel to prevent rotation of said wheel in said opposite direction while permitting rotation of said wheel in said one direction and a second position spaced from said wheel, and a second lever member pivotally mounted about said second axis and having a slot with said second catch member passing therethrough;

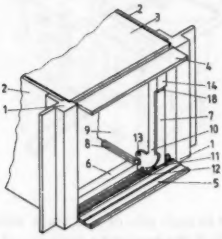
a first operating member connected to said first lever member and being slidably mounted on said rack in a horizontal plane for movement between a locking position and an unlocking to pivot said first lever member about said first axis to cause said first catch member to pivot between said first and second positions thereof, said operating member having a terminal end exposed to the exterior of said rack; and

a second operating member connected to said second lever member and being slidably mounted on said rack in a horizontal plane for movement between a locking position and an unlocking position to pivot said second lever member about said second axis to cause said second catch member to pivot between said first and second positions thereof, said second operating member having a terminal end exposed to the exterior of said rack whereby as each of said operating members is slid into its locking position, said rack is locked against movement in a respective one of said opposite directions thereof.

4,256,356
APPARATUS FOR INSERTING AND WITHDRAWING SUBASSEMBLIES

Walter Roth, Wutöschingen Hochrhein, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 5, 1979, Ser. No. 17,427
Claims priority, application Switzerland, Mar. 6, 1978, 2377/78
Int. Cl.³ H05K *5/00*
U.S. Cl. 312—320 **11 Claims**



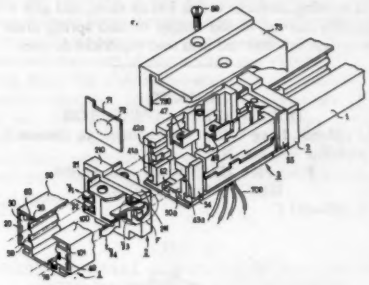
1. An apparatus for inserting and withdrawing subassemblies in subassembly holders, comprising:
- a front plate on said subassembly;
- a lever having two arms and being rotatably mounted in said subassembly;
- a locking element on a longer arm of said lever, said longer arm including a handle in which said locking element is located;
- a shifter element on the shorter arm of said lever;
- a profile plate fixed to said subassembly holder, said shifter element projecting into the profile portion of said profile plate, said shifter element comprising a toothed wheel segment and said profile plate having the profile of a horizontal toothed rack section; and
- a locking member movably disposed in a recess in said front plate of said subassembly; wherein said locking member comprises a guide element with a vertical U-shaped opening lying in its center, said U-shaped opening being not continuous in the lower part of said guide element, two symmetrical substantially n-shaped openings along the outside of the shanks of said U-shaped opening, and an actuator which is positioned at the front of, and is connected to, the center part of said locking member by way of a bridge.

4,256,357
SET OF CONNECTING ACCESSORIES FOR AN ELECTRICAL SUPPLY RAIL WITH AN ASYMMETRICAL PROFILE

Bernard Vasseur, and Alain Boucaut, both of Lamotte Beuvron, France, assignors to Lita, Lamotte Beuvron, France

Filed Apr. 10, 1979, Ser. No. 28,855
Claims priority, application France, Apr. 14, 1978, 78 11060
Int. Cl.³ H01R *9/00;* H02G *3/06*
U.S. Cl. 339—21 R **4 Claims**

1. A set of connecting accessories for connecting at least one electrical supply rail to a second element, said rail and element having two slideways in two different planes, said rail having an asymmetrical profile containing n conductors to be joined to n conductors of said element comprising:
- a line connecting accessory including an insulating support having two guide portions for engaging said slideways of said rail and element; and n conducting contact parts each having right and left wings and a central part, one of said wings of each contact part electrically connecting to a conductor of said element and the other wing connecting to a conductor of said rail; said support being symmetrical with respect to a central plane perpendicular to the longitudinal axis of said rail so that said connector can be clipped to either end of a rail; and
- a universal supply box for receiving one of said guide portions and one of said wings of each of said n contact parts so as to clip and electrically connect said line connecting accessory thereto, including a support block having a plurality of sockets and first and second sides, first and second conformers joined to said sides, n contact parts

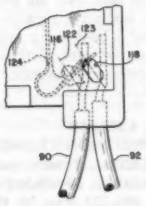


extending from said first side to said second side and into said conformers, each contact part of said supply box having at least one foot for being fixed to one of said sockets, each of said conformers being adapted for receiving a line connecting accessory with a wing electrically connecting to an end of one of said contact parts of said supply box, and a main supply conductor for electrically connecting a power supply to said n contact parts of said supply box.

4,256,358
WIRE ENGAGEMENT AND RELEASE ARRANGEMENT

Earl J. Genz, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 3, 1979, Ser. No. 99,391
Int. Cl.³ H01R *11/22;* H01H *5/22*
U.S. Cl. 339—95 D **7 Claims**



1. A wire engagement and release arrangement for an electrically operated device comprising a housing having a pair of substantially parallel housing surfaces, a pair of closely spaced wire openings through said housing, each of which is dimensioned so as to allow for the insertion of an electrical wire having a bare end therein, housing walls adjacent to said wire openings, a flat bifurcated spring contact member secured in said housing and having a pair of spring arms which are positioned so that their wide dimension runs substantially normal to said parallel surfaces, said contact member having a bend therein which provides a spring bias to said spring arms, said housing having an area against which said spring arms are biased, one of said spring arms being longer than the other of said spring arms and the ends of said spring arms being located relative to said wire openings so that when said bare ends of

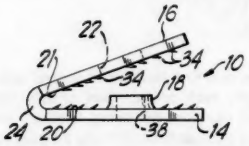
said electrical wires are inserted into said wire openings they will engage said spring arms causing them to deflect and thereby force said bare ends against said housing walls thereby clamping said bare ends between said spring arms and said housing walls, and wire release means comprising a first elongated aperture located in one of said parallel housing surfaces and having an elongated axis which is substantially normal to the shorter of said spring arms when said wires are not inserted into said electrical device and a second elongated aperture which is opposite from said first aperture in the second of said parallel housing surfaces which has an elongated axis which is substantially normal to the longer of said spring arms when said wires are not inserted into said electrical device.

4,256,359

TERMINATION CONNECTOR

Glenn E. Storck, Long Valley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed May 25, 1979, Ser. No. 42,356
Int. Cl.³ H01R *11/20, 4/10*
U.S. Cl. 339—97 C **40 Claims**



1. A terminal connector for a flat cable, said connector comprising:

a bendable member for bending along a bending line, said bendable member including a first arm portion and a second arm portion separated from one another by said bending line;

a male die member on said first arm portion extending away from the surface of said first arm portion and having at its distal end a peripheral edge therethrough;

said second arm portion including therethrough an opening for receiving said male die member, said opening having a periphery that is configured to interact therearound with the peripheral edge of said male die member, defining a pair of progressively operative shearing members when said bendable member is bent along said bending line to move said first and second arm portions toward one another into a closed connecting position.

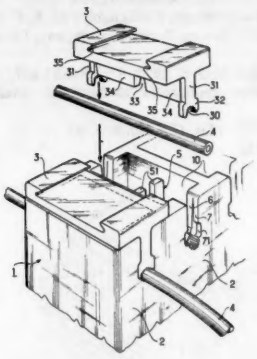
4,256,360

RAPID-CONNECTION TERMINAL

Jean Debaigt, Maisons Laffitte, France, assignor to Societe Anonyme dite: CGEE Alsthom, Levallois-Perret, France

Continuation of Ser. No. 938,272, Aug. 30, 1978, abandoned. This application Jan. 17, 1980, Ser. No. 112,985
Claims priority, application France, Sep. 21, 1977, 77 28402
Int. Cl.³ H01R *4/10*
U.S. Cl. 339—97 R **12 Claims**

1. A rapid-connection terminal for a conductor formed by a conductive core and an insulating covering, said terminal comprising an insulating housing, said housing including laterally opposed, parallel sidewalls, a contact blade mounted within said housing between said walls and in parallel therewith, said blade including a slot opening from one end and forming resilient arms to receive said conductor inserted therein for stripping of the conductor insulating covering, the improvement wherein said arms are oppositely notched on edges forming said slot such that the core of the conductor is locked when inserted therein, and during which the insulating covering is removed from said inserted conductor, and wherein said opposed sidewalls of said insulating housing further comprise first notches aligned with the slot within said blade and which converge in the direction of the blade opening and which terminate at the level of said blade arm edge notches



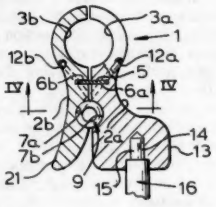
to define a socket to each side of said blade within the insulating housing in which the insulating covering of the conductor is pinched.

4,256,361

BATTERY POST CLAMP MEMBER

Joseph P. Bell, Rte. 1, Box 262D, Grayslake, Ill. 60030

Filed Jul. 16, 1979, Ser. No. 57,591
Int. Cl.³ H01R *4/48*
U.S. Cl. 339—228 **4 Claims**



1. A battery connector, for connecting a battery cable to a battery terminal, comprising a pair of cooperable clamp members disposed in side-by-side non-crossing relation, each having a recess in its opposing face, each of said recesses being generally semicylindrical and aligned to form a generally cylindrical bore in the assembled structure, a torsion spring comprising a coiled helical portion terminating at its ends in tangentially extending leg portions, said spring having its coiled portion thereof disposed in said bore with each leg portion disposed adjacent to and engaged with a respective clamp member for inserting forces on said clamp members to retain said clamp members in assembled relation, each of said clamp members having a further recess therein, disposed to form cooperable terminal-engaging portions adapted to clamp a battery terminal therebetween and connecting means connecting said clamp members at opposed faces, intermediate said spring recesses and said terminal engaging recesses, said connecting means being fixedly carried by one of said clamp members and slidably engaging the other of said clamp members for maintaining said members in operative aligned relation but permitting separating movement thereof, one of said clamp members having means thereon for the reception and securing of the conductor of a battery cable, said connecting means comprising a relatively thin flat metallic strip having a pair of ends, and said clamp members including respective slots receiving said flat metallic strip, said slots being so designed that said strip is

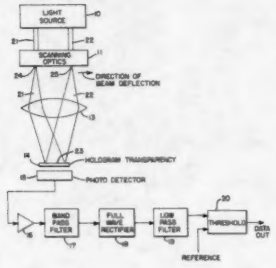
received in one of said slots by a press fit and is slidable in the other of said slots.

4,256,362

PHASE-INSENSITIVE HOLOGRAM READOUT TECHNIQUE

Andrew M. Bardos, Palm Bay, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Jan. 31, 1978, Ser. No. 873,833
Int. Cl.³ G03H 1/22
U.S. Cl. 350—3.86 **51 Claims**



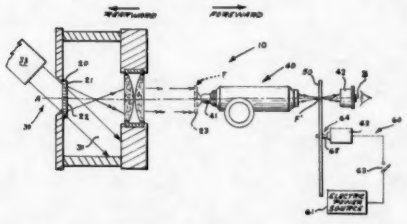
1. In a method of reconstructing information stored in the form of a single hologram, wherein reconstruction energy is directed upon said hologram to thereby form a reconstructed representation of the information stored in said hologram, the improvement comprising the steps of causing said reconstruction energy to form a reconstruction intensity pattern on said hologram, which pattern contains a translating fringe system with a time varying spatial frequency, and integrating the entirety of the information pattern emanating from said hologram onto a single photodetector, so as to retrieve all of the data contained in said single hologram in a time swept fashion.

4,256,363

SPECKLE SUPPRESSION OF HOLOGRAPHIC MICROSCOPY

Robert A. Briones, Monterey Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1978, Ser. No. 932,986
Int. Cl.³ G03H 1/22
U.S. Cl. 350—3.86 **7 Claims**



1. An apparatus for reconstructing and viewing a holographic image, comprising:

a. a developed hologram plate having a front surface on which a holographic image has been recorded, wherein said image has speckle patterns therein;

b. means for illuminating said hologram plate with and by a beam of directional, monochromatic, coherent light, whereby a reconstructed real holographic image having speckle patterns is formed and projected;

c. a microscope having an objective, and an eyepiece forward of said objective, with said microscope forward of, and in optical alignment with, said reconstructed, speckled, real holographic image, whereby said image impinges upon and is transmitted forwardly by said microscope objective, and thereby a focal point of said transmitted image is formed at a location forward of said microscope objective and rearward of said microscope eyepiece;

d. a rotatable, finely-structured, transparent light diffuser disposed in optical alignment with said microscope objective and rearward of said microscope eyepiece, wherein said diffuser is concurrently disposed at said focal point formed at said location forward of said microscope objective and rearward of said microscope eyepiece;

e. and, means for selectively rotating said rotatable diffuser;

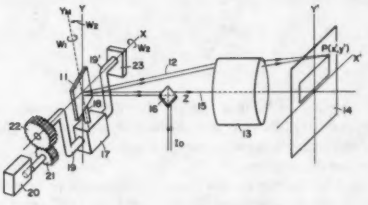
whereby, when said diffuser is rotated, said speckle patterns in said reconstructed real holographic image are significantly reduced, thereby permitting the viewing of a speckle-reduced reconstructed real holographic image through said microscope eyepiece, without loss of resolution of said image.

4,256,364

TWO-DIMENSIONAL SCANNING OPTICAL SYSTEM WITH DISTORTION CORRECTION

Kazuo Minoura, Yokohama; Masamichi Tateoka, Kawasaki, and Setsuo Minami, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1979, Ser. No. 11,859
Claims priority, application Japan, Feb. 20, 1978, 53-18349
Int. Cl.³ G02B 27/17
U.S. Cl. 350—6.9 **7 Claims**



1. A two-dimensional scanning optical system, comprising:

a deflector for two-dimensionally deflecting a beam in two mutually orthogonal directions;

a spherical imaging optical system adapted to focus the beam deflected by said deflector onto a plane to be scanned and provided with a distortion aberration for obtaining a linear trajectory of said beam on said plane; and

beam supply means for introducing said beam into said deflector in such a manner that the beam trajectory on said plane is affected by said distortion aberration of said imaging optical system equally in mutually orthogonal directions.

4,256,365

OPTICAL FIBRE COUPLER

Marcel E. Lemesle, 3 Rue Emile le Gac, Perros Guirec, France (22700); Marcel H. Guibert, 20 Cite Saint Roch, and Claude A. Le Moing, 33 Avenue de Lorraine, both of Lannion, France (22300)

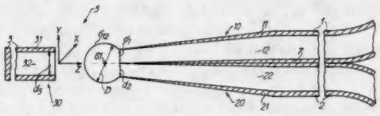
Filed Jun. 18, 1979, Ser. No. 49,226
Claims priority, application France, Jun. 29, 1978, 78 19438
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.18 **13 Claims**

1. An optical fibre coupler comprising:

two branches constituted by first and second optical fibres, each having a frustoconical portion at one end;

said two frustoconical portions being fastened to one another and each terminated by a common spheroidal end

centred on the common generatrix of said frustoconical portions; and



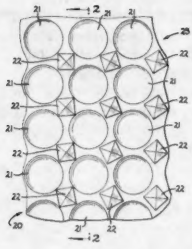
a third branch constituted by at least a third optical fibre having one end laid opposite said common spheroidal end.

4,256,366

AIRCRAFT VISUAL COLLISION AND AVOIDANCE DEVICE

Arthur L. Buckelew, 977 Jeannette Ave., Thousand Oaks, Calif. 91360

Filed Apr. 9, 1979, Ser. No. 28,267
Int. Cl.³ G02B *5/12*
U.S. Cl. 350—97 **11 Claims**



1. a "see and be seen" device for use on aircraft capable of receiving light from at least a one direction and for redirecting it in multiple directions, comprising:

(a) a reflective means;

(b) a refracting means disposed adjacent to said reflective means for directing light toward said reflective means;

whereby the reflected light causes said aircraft to be visually identified and located by any other aircraft pilots in the vicinity.

4,256,367

STEREOSCOPIC VIEWER - BOOKLET DEVICE

Robert G. Connors, Stagecoach Rd., Woodbury, Conn. 06798

Filed Jun. 11, 1979, Ser. No. 47,495
Int. Cl.³ G02B *27/22*
U.S. Cl. 350—135 **14 Claims**

1. A hand held stereoscopic viewer, the combination comprising:

a film strip having at least one stereoscopic image thereon composed of a pair of recorded frames having a predetermined separation therebetween;

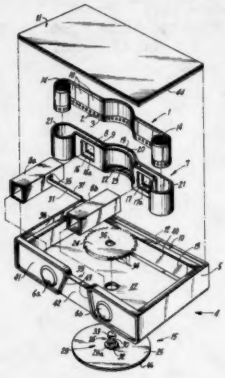
a booklet having information pertaining to said stereoscopic image;

a housing having a nest portion for receiving said booklet therein so as to position a portion of the booklet to serve as booklet top cover means for effecting a film retainer-guard covering to said film guide channel means and to enable carriage of information pertaining to said stereoscopic image;

a pair of lenses mounted on said housing and having a separation therebetween less than the separation between said pair of frames;

a pair of parallel spaced lens tubes each having a first aperture aligned with a lens of said pair of lenses and extending within said housing a length approximately equal to the focal length of the lenses;

film guide channel means within said housing having two viewing openings each aligned with a second aperture of each of said lens tubes for guiding said pair of frames past said openings and thereby into the field of view of the lenses;



film take-up means between said viewing openings for drawing in film to effect simultaneous registration of said pair of frames each with a viewing opening with said film strip being guided past said viewing openings; and

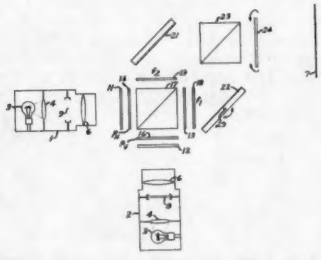
film drive means to engage and advance the film strip having a rotatably mounted disk on the outside of said housing manually actuatable for driving said film strip to locate said pair of frames in registration with the viewing openings.

4,256,368

COLOR CONTRAST SENSITIVITY MEASURING DEVICE

Harry L. Task, Montgomery County, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 7, 1980, Ser. No. 110,145
Int. Cl.³ G02B *27/18, 27/28;* G03B *27/72, 21/00*
U.S. Cl. 350—408 **4 Claims**



1. An apparatus for creating a visual test pattern in which color contrast is variable while photometric luminance remains substantially constant, comprising:

a first projecting beam of broad spectrum luminous energy, said beam being substantially uniform in intensity;

a second projecting beam of broad spectrum luminous energy, said second beam containing a spatially variable intensity pattern;

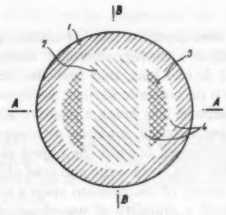
a means for polarizing said first and second beams;
a means for splitting each beam and coaxially interleaving the segments;
a pair of color filters, one in the path of each beam containing interleaved segments;
a means for altering the relative spatial phase of the beams containing interleaved segments;
a means for combining the beams containing interleaved segments into a single coaxial beam; and
a movable polarizer in the path of said single coaxial beam.

4,256,369

TORIC HYDROGEL CONTACT LENS

Otto Wichterle, Prague, Czechoslovakia, assignor to SPOFA, spojene podniky pro zdravotnichou, Prague, Czechoslovakia

Filed Apr. 25, 1979, Ser. No. 33,322
Claims priority, application Czechoslovakia, May 4, 1978, 2855-78
Int. Cl.[3] G02C *7/04*
U.S. Cl. 350—160 H 6 Claims



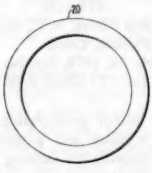
1. A toric hydrogel contact lens comprising a concave inner surface having a shape of a meniscus obtained by a rotating liquid and an outer convex surface having a rotation-symmetric peripheral ring, a toric central part and two longitudinal strips which have a cylindric component parallel to the central toric part but of the opposite sign, said longitudinal strips being linked with its central part by parallel bands spaced one from the other at least 4 mm., said peripheric ring, said toric central part and said longitudinal strips being linked by continuous transition bands.

4,256,370

CORED LENS FOR LARGE REFRACTING TELESCOPES

Louis Gold, 2725 39th St., NW., Washington, D.C. 20007

Continuation of Ser. No. 771,703, Feb. 24, 1977, abandoned, which is a continuation of Ser. No. 619,166, Oct. 3, 1975, abandoned. This application May 4, 1978, Ser. No. 902,631
Int. Cl.[3] G02B *13/00*
U.S. Cl. 350—440 1 Claim



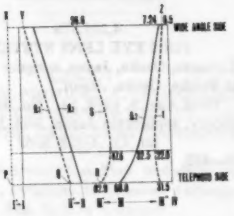
1. An annular cored lens having an outer diameter substantially greater than 40" (forty inches) with an inner diameter allowing a light-gathering ability substantially larger than the fourty inch solid disc lens.

4,256,371

ZOOM LENS WITH EXTENDED VARIABLE FOCAL LENGTH RANGE

Atsushi Someya, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1979, Ser. No. 49,165
Claims priority, application Japan, Jun. 23, 1978, 53-76124; Jun. 23, 1978, 53-76125; Jul. 10, 1978, 53-83756
Int. Cl.[3] G02B *15/16*
U.S. Cl. 350—423 9 Claims



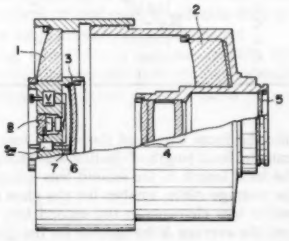
1. A zoom lens with an extended variable focal length range comprising:
a plurality of movable lens groups forming a common optical axis and movable along the optical axis through an ordinary zooming range in which the focal length is varied within an ordinary focal length range and for an extended zooming range beyond the ordinary focal length range; and
a prime lens group fixed in the ordinary zooming range and moved simultaneously with said movable lens groups when said ordinary zooming operation passes into the extended zooming range.

4,256,372

CATADIOPTRIC LENS SYSTEM WITH LIGHT TRANSMISSION CONTROL MEANS

Mitsuo Yasukuni, Sakai; Hiroshi Kiten, Mino; Takashi Iida; Kunio Kawamura, both of Sakai, and Nobuo Yoshida, Hachioji, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1978, Ser. No. 947,737
Claims priority, application Japan, Oct. 3, 1977, 52/131482[U]
Int. Cl.[3] G02B *17/08, 5/22;* G03B *9/56*
U.S. Cl. 350—444 13 Claims



1. A self-contained electronic light attenuating catadioptric lens system for a camera comprising:
a lens barrel;
means for exchangeably mounting the catadioptric lens system on a camera;
a plurality of light reflecting surfaces mounted in the lens barrel;

a plurality of light refracting surfaces mounted in the lens barrel;

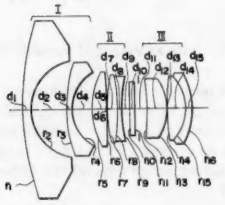
an electrochromic device in the lens barrel for variably attenuating the light transmission through the lens system, whereby the light reflecting and refracting surfaces define an optical path for forming an image of an object and the electrochromic device operatively interfaces with the optical path; and

electric circuit means including a power source for controlling the electrochromic device, the electric circuit means being located in the lens barrel.

4,256,373
FISH EYE LENS SYSTEM

Mitsuaki Horimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1978, Ser. No. 932,179
Claims priority, application Japan, Aug. 17, 1977, 52/98894
Int. Cl.³ G02B 9/62
U.S. Cl. 350—463 **18 Claims**



1. An improved fish eye lens system comprising from the object to the image side:

a first lens group of a negative refractive power consisting of two negative meniscus single lenses each being convex to the object side;

a second lens group of a positive refractive power including at least a doublet having an intermediate cemented surface; and

a third lens group of a positive refractive power including at least a positive meniscus single lens, convex to the image side, and a doublet having an intermediate cemented surface, wherein the lens system fulfills the following conditions:

0.5	<	$\lvert f_I \rvert / f$	<	0.8
1.5	<	f_{II}/f	<	2.8
8.0	<	$\overline{\nu}_N - \overline{\nu}_P$	<	25.0
0.7	<	$\lvert r_{II} \rvert / f$	<	3.5
0.18	<	$\overline{N}_N - \overline{N}_P$	<	0.36
0.6	<	$\lvert r_{III} \rvert / f$	<	1.7
2.2	<	$\Sigma d/f$	<	3.2
0.65	<	r_2/f	<	0.92

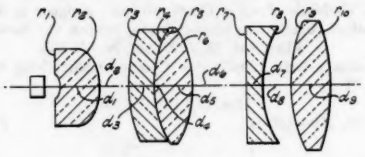
wherein;

f represents the focal length of the whole lens system; f_I represents the focal length of the first lens group; f_{II} represents the focal length of the second lens group; $\overline{\nu}_P$ represents the average Abbe number for the glass material of the positive lens elements in the second lens group; ν_N represents the average Abbe number for the glass material of the negative lens elements in the second lens group; r_{II} represents the radius of curvature of the intermediate cemented surface in the second lens group; N_P represents the average refractive indices of the glass material for the positive lens elements in the third lens group; N_N represents the average refractive indices of the glass material for the negative lens elements in the third lens group; r_{III} represents the radius of curvature of the cemented surfaces in the third lens group; Σd represents the total length of the lens system along the optical axis; and r_2 represents the radius of curvature of the image side surface of the negative meniscus single lens located at the front of the first lens group.

4,256,374
WRITE AND READ OBJECTIVE LENS FOR HIGH DENSITY STORAGE

Lee Mickleson, Long Beach, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Filed Apr. 2, 1979, Ser. No. 25,803
Int. Cl.³ G02B 9/34
U.S. Cl. 350—472 **3 Claims**



1. A write and read objective lens for encoding and recovery of information upon a storage member comprising a first, second, third and fourth lens, said first lens being a positive meniscus lens with its concave surface positioned toward the object side, said second lens being a positive achromatic doublet, said third lens being a negative meniscus lens with its convex surface positioned toward the object side, said fourth lens being a positive lens,, said write and read objective lens for encoding and recovery of information upon a storage member being utilizable with a plurality of wavelengths of light, said write and read objective for encoding and recovery of information upon a storage member satisfying the following conditions:

1.	1.24	≧	r_6/f	≧ 1.17
2.	0.46	≧	d_1/f	≧ 0.37
3.	0.27	≧	$\lvert r_6 \rvert / \lvert r_7 \rvert$	≧ 0.21
4.	1.20	≧	$\lvert f_3 \rvert / \lvert f_4 \rvert$	≧ 1.00
5.	0.45	≧	d_5/f	≧ 0.40

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f_3 represents the focal length of the third lens, reference symbol f_4 represents the focal length of the fourth lens, reference symbol r_6 represents the radius of curvature of the surface on the image side of the second lens, reference symbol r_7 represents the radius of curvature of surface on the object side of the third lens, reference symbol d_1 represents the thickness of the first lens and reference symbol d_5 represents the thickness of the third lens.

4,256,375
REMOTE CONTROLLABLE MOTORIZED REAR VIEW MIRROR

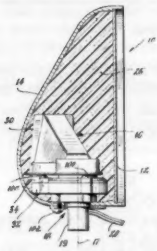
Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Feb. 26, 1979, Ser. No. 14,801
Int. Cl.³ G02B 5/08
U.S. Cl. 350—289 **11 Claims**

1. In a rear view mirror positionable by remote control, including a mirror housing and a motorized driving unit mounted inside said housing for turning the housing about a relatively fixed axis to adjust the viewing range of a mirror fixed to the housing, the improvement wherein said unit comprises:

(1) a mirror supporting post having a lower portion thereof protruding from said housing to be fixed to a support for mounting the mirror on a vehicle,

(2) a gear casing supported on and turnable about said post, said casing being fixed to said housing and containing gear means including a ring gear coaxial with said post, means normally holding said ring gear fixed relative to said post, and a series of speed reducing gears supported by said



casing and drivingly engaged with the periphery of said ring gear, and

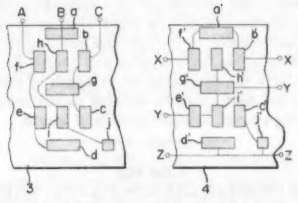
(3) a rotary electric motor supported on said casing and drivingly engaged with said series of gears for driving the latter and thereby turning said casing and said housing relative to said post.

4,256,376

ELECTRO-OPTICAL DISPLAY ELEMENT

Shunsuke Kobayashi, Tokyo; Akira Miyaji, and Yoshio Nara, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 25, 1979, Ser. No. 51,881
Int. Cl.³ G02F 1/133
U.S. Cl. 350—336 **4 Claims**



1. An electro-optical display element of the multiplexing type comprising:

(a) a first and a second electrode substrate opposed to each other, each of said electrode substrates having combinations consisting of, in order from above, first, second and third lateral segments juxtaposed, a longitudinal upper left segment, upper middle segment and upper right segment juxtaposed between said first and second segments, and a longitudinal lower left segment, lower middle segment and lower right segment juxtaposed between said second and third segments and a point segment for displaying the decimal point;

(b) an optical member provided between said two electrode substrates and electrically responsive;

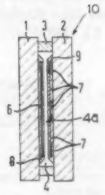
(c) a first, a second and a third signal terminal provided on said first electrode substrate, said first signal terminal being connected to said upper left segment, said lower left segment and one of said third segment and said point segment, said second signal terminal being connected to said first segment, said upper middle segment, said lower middle segment and the other of said third segment and said point segment, said third signal terminal being connected to said upper right segment, said second segment and said lower right segment; and (d) a first, a second and a third scanning terminal provided on said second electrode substrate, said first scanning terminal being connected to said upper left segment, said first segment and said upper right segment, said second scanning terminal being connected to said lower left segment, said lower middle segment, said second segment and said upper middle segment, said third scanning terminal being connected to said third segment, said lower right segment and said point segment.

4,256,377

PROCESS FOR PRODUCING HOMEOTROPIC ORIENTATION LAYERS FOR LIQUID CRYSTAL DEVICES AND THE RESULTANT LIQUID CRYSTAL DEVICES

Hans Krueger, Munich, and Hans Pink, Starnberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,003
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722900
Int. Cl.² G02F 1/13
U.S. Cl. 350—340 **21 Claims**



1. A process of producing a homeotropically orientating layer on a liquid crystal cell substrate, comprising:

forming an organic liquid solution containing a suitable amount of Si and Me to provide a necessary ratio of such materials to form an orientatiion layer having a chemical composition defined by the formula:

$$(Me_2O_3)_{1-x}(SiO_y)_x$$

wherein Me is an element selected from the group consisting of Al and Cr, x is a numeral greater than 0 and smaller than 1, and y is a numeral at least equal to 1.9 and not more than 2;

applying a layer of said organic solution onto at least one face of a liquid crystal cell substrate; and

transforming said layer of organic solution into a solid homeotropically orientating layer having said chemical composition by thermal decomposition of said organic solution.

4,256,378

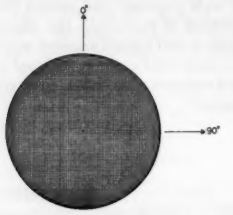
GRAPHITE-GLASS COMPOSITE LASER MIRROR

Karl M. Prewo, Vernon, Conn., and Robert K. Stalcup, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1979, Ser. No. 54,098
Int. Cl.³ G02B 5/08
U.S. Cl. 350—310 **5 Claims**

1. A laser mirror comprising a graphite fiberglass matrix composite having a graphite fiber lay-up in the glass matrix

producing a symmetrical and balanced composite, containing 40%–70% volume graphite fibers, having an outer laser re-



flecting layer, and having a graphite fiber orientation in the composite of 0°/90°, 0°/45°/90° or 0°/60°.

4,256,379

ELECTROCHROMIC DEVICE

Mino Green, London, England, assignor to Imperial Chemical Industries Limited, London, England

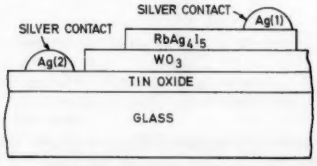
Continuation of Ser. No. 813,420, Jul. 6, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,079

Claims priority, application United Kingdom, Jul. 7, 1976, 28241/76

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **11 Claims**



1. An electrochromic device comprising a first electrode, a layer of a metal-sensitive compound in contact with the first electrode and in contact with a solid fast ion conductor in which fast ion conductor the fast ion is an ion of a metal which dissolves in the metal sensitive compound to change the colour thereof, the fast ion conductor itself being in contact with a second electrode capable of providing ions the same as the fast ions of the conductor, said layer of metal sensitive compound having a thickness of 1 micrometer or less.

4,256,380

COUNTER ELECTRODE ARRANGEMENT OF AN ELECTROCHROMIC DISPLAY DEVICE

Donald J. Barclay, Winchester; Anthony C. Lowe, North Baddesley, and David H. Martin, Hants, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,425

Claims priority, application United Kingdom, Dec. 20, 1978, 49274/78

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **7 Claims**

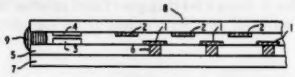
1. An electrochromic display device having at least one display electrode comprising

an electrolyte associated with the display electrode,

a counter electrode in contact with said electrolyte that is maintained charged to a given potential during operation,

a donor electrode for transferring a charge to said counter electrode during operation,

a reference electrode for sensing the potential of said counter electrode during operation, and



electric circuit means responsive to the potential sensed by said reference electrode to cause said donor electrode to transfer charge to said counter electrode so as to maintain said counter electrode at the given potential.

4,256,381

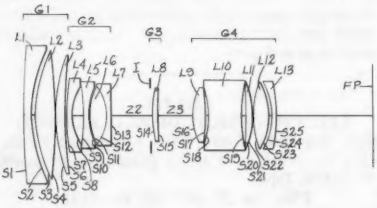
ZOOM LENS

Melvyn H. Kreitzer, Cincinnati, Ohio, assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Jan. 31, 1980, Ser. No. 117,369

Int. Cl.³ G02B *15/14*

U.S. Cl. 350—423 **31 Claims**



1. A lens of variable equivalent focal length comprising from the object end a first positive group, a second negative group, an aperture defining means, a third positive group closely spaced in fixed relation to the aperture defining means, and a fourth positive group, said second and fourth groups being movable to vary the equivalent focal length of the lens, said third group and said aperture defining means remaining stationary during change in equivalent focal length.

4,256,382

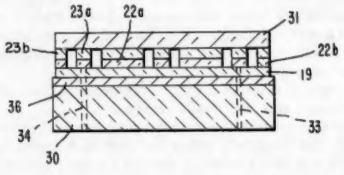
LIQUID CRYSTAL DEVICES HAVING UNIFORM THERMAL EXPANSION COEFFICIENT COMPONENTS

Michael A. Piliavin, Encino, and Geza Csanky, Sepulveda, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 3, 1979, Ser. No. 35,679

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—334 **10 Claims**



1. In a liquid crystal cell having an optically transparent faceplate coated with an optically transparent and electrically conductive film on a surface of the faceplate, said cell being adapted for use with a circuit formed in semiconductor material, said cell retaining liquid crystal material between the

semiconductor material and the electrically conductive film, wherein the improvement includes a membrane comprising:

a generally flat semiconductor component having a pair of oppositely disposed first and second surfaces, said first surface being in contact with said film, and a rib structure having a plurality of spaced-apart semiconductor members, said rib structure being disposed between said second surface and said semiconductor material so as to define discrete cell areas and with said liquid crystal material being retained between the semiconductor rib members, whereby the thermal expansion of the combination of the membrane and the liquid crystal material substantially matches the thermal expansion of said semiconductor material, and the rib structure functions to constrain cell deformation and warpage and to isolate cell areas from one another.

4,256,383

ELECTRO-OPTICAL DISPLAY

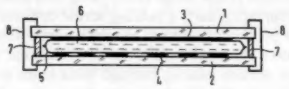
Gerhard Wessel, Stuttgart; Jürgen Pottharst, Stuttgart-Möhringen, and Kurt Koger, Oberriexingen, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 6, 1979, Ser. No. 91,918

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849835

Int. Cl.³ G02F *1/01*

U.S. Cl. 350—343 **8 Claims**



1. Electro-optical display in which, between plates coated with conductors, of which at least one is made of a material permeable to light and coated with an electrode pattern likewise permeable to light, there is arranged one layer of a liquid or semi-liquid electro-optical material which, under the effect of an electric field, changes its optical properties, characterized in that the electro-optical material is contained in a flat bag of transparent plastic material arranged between the plates.

4,256,384

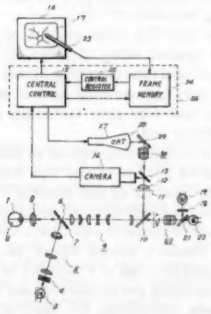
EYEBALL EXAMINING DEVICE

Kazutaka Kani; Kuniomi Abe; Masahiko Konagaya, all of Kobe, and Noboru Ono, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Hyogo, Japan

Filed Oct. 15, 1979, Ser. No. 85,002

Int. Cl.³ A61B *3/14, 3/10;* G03B *29/00*

U.S. Cl. 351—7 **3 Claims**



1. An eyeball examining device, comprising a television pick-up camera, a main optical system for coupling an eye ground image to said television camera, an infrared ray source, means for directing infrared rays from said source to the eye ground, and a television monitor for displaying the image picked up by said television camera, said device further comprising a cathode ray tube scanned in synchronism with said television monitor, means for generating an image signal and coupling it to said television monitor and cathode ray tube, and an optical system for introducing the displayed image of said cathode ray tube into said main optical system to project it upon the eye ground.

4,256,385

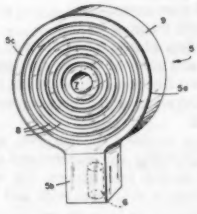
CORNEA-EXAMINING INSTRUMENT

Samuel W. Cohen, and Settimio Infantino, both of Brooklyn, N.Y., assignors to Velotron Machine Corp., Brooklyn, N.Y.

Filed Feb. 22, 1979, Ser. No. 14,080

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—13 **19 Claims**



1. A pocket-type instrument for determining the shape of a cornea of an eye, comprising an examining element of a transparent material having at least one light-reflective formation thereon which is centered on an axis wherein said examining element has a periphery extending parallel to the axis, the periphery having an inwardly facing light-reflective layer to reflect light rays reaching the periphery back into the examining element; and a portable source of light so positioned relative to said examining element that a light beam emitted thereby is directed transversely of said axis to illuminate said formation and to be reflected thereby onto the cornea being examined when said axis intersects the same, forming an image of the formation on the cornea, the shape of such image being indicative of the shape of the cornea.

4,256,386

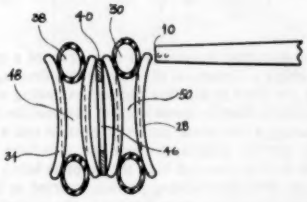
UNDERWATER VISION DEVICE

Linton M. Herbert, 762 E. Michigan Ave., No. 204, Orlando, Fla. 32806

Filed Nov. 23, 1979, Ser. No. 96,898

Int. Cl.³ G02C *1/00*

U.S. Cl. 351—43 **14 Claims**



1. An underwater vision device supported by the nose and ears of a wearer comprising:

a. a frame including

(i) a front element having a nose piece for contacting and

being supported by the wearer's nose, said front element having first and second apertures aligned with the wearer's eyes

(ii) a first ear piece coupled to one end of said front element and a second ear piece coupled to the other end of said front element, said first and second ear pieces contacting the wearer's ears to maintain said frame in a desired fixed position on the wearer's head;

b. first and second lens elements coupled to said front element in alignment with the first and second apertures, each of said lens elements including

(i) a first lens group having one end coupled to said front element in alignment with one of the apertures therein, said first lens group including

A. a first solid transparent lens

B. a second solid transparent lens

C. securing means coupled to said first and second lenses for securing said first and second lenses together and for forming a sealed air chamber between said first and second lenses;

(ii) a second lens group including

A. a first solid transparent lens

B. a second solid transparent lens

C. a length of hollow plastic tubing formed into a circle and joined end to end coupled to said first and second lenses for securing said first and second lenses together and for forming a sealed air chamber between said first and second lenses; and

(iii) spacer means coupled to said first and second lens groups for maintaining a predetermined spacing between said first and second lens groups, for maintaining said second lens group in alignment with said first lens group, and for forming a cavity between said first and second lens groups which fills with water when said device is immersed in water.

4,256,387

DEVICE FOR CONNECTING LUGS ON METAL RIM OF SPECTACLE FRAME

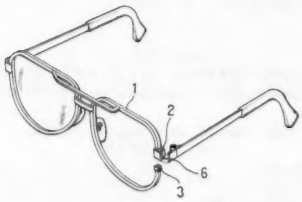
Niro Kato, Sabae, Japan, assignor to Kabushiki Kaisha Kato Kogei, Fukui, Japan

Filed Nov. 13, 1979, Ser. No. 93,009

Claims priority, application Japan, Apr. 20, 1979, 54/53746[U]

Int. Cl.³ G02C *1/04*

U.S. Cl. 351—90 **14 Claims**



1. A lug connecting device for a metal rim of a spectacle frame comprising a horizontal slit formed in a first lug on the metal rim, a pin fixed to the first lug and extending toward a second lug provided on the metal rim and adjacent the first lug, a tie plate having a horizontal attaching portion and a vertical plate spring portion extending from the attaching portion alongside the first and second lugs, the tie plate being secured to the first lug with its attaching portion inserted in the horizontal slit of the first lug, a bore formed in the second lug and having the pin snugly fitted therein, a stop provided on the second lug, and an aperture formed in the plate spring portion of the tie plate and having the stop disengageably engaged therein, the plate spring portion having spring properties so as to be elastically deformable with torsion of the metal rim when the metal rim is subjected to a twisting force while the lugs are connected together by the engagement of the stop in the aperture.

4,256,388

BEARING SCREW AND ITS USE AS A HINGE-PIN IN SPECTACLES

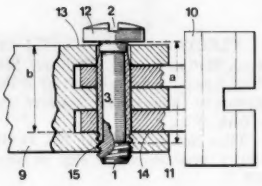
Karl Beyer, Geneva, Switzerland, assignor to La Nationale S.A., Geneva, Switzerland

Filed Apr. 27, 1978, Ser. No. 900,765

Claims priority, application Switzerland, May 5, 1977, 5619/77

Int. Cl.³ G02C *5/22*

U.S. Cl. 351—158 **10 Claims**



7. A spectacle frame hinge comprising two knuckles having mutually interfitting ears, a bearing screw constituting a hinge pin, an end portion of said pin having a screw thread thereon screwed into a threaded hole in an outermost ear and a cylindrical shank portion passing through plain holes in the remaining ears wherein the shank portion has a diameter which is equal to the inner diameter of the thread and less than the diameter of said holes, a sleeve of synthetic resin in abutment with said thread and tightly fitting said shank in the lesser diameter portion thereof, the maximum diameter of the sleeve being substantially equal to the diameter of said plain holes and to the overall diameter of the threaded end portion.

4,256,389

METHOD AND SYSTEM OF CONTROLLING SOUND AND EFFECTS DEVICES BY A FILM STRIP

Mark E. Engebretson, Warner Springs, Calif., assignor to Paramount Sound Systems Corporation, Glendale, Calif.

Continuation of Ser. No. 946,117, Sep. 27, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,180

Int. Cl.³ G03B *31/00*

U.S. Cl. 352—11 **11 Claims**

1. A method of controlling a plurality of distinct devices in a theater displaying a projected motion picture contained on a moving film strip in synchronization with said film strip, said method comprising the steps of:

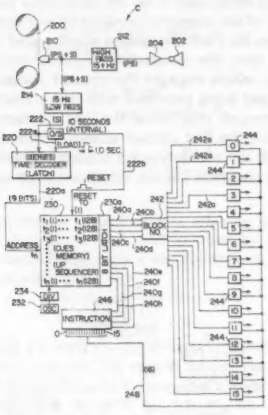
(a) providing on said film strip a series of synchronizing signals evenly spaced along said film to define a time interval between said synchronizing signals when said film is moving at a selected rate with each of said synchronizing signals on said film strip including a distinct time interval identifying code;

(b) reading said synchronizing signals as they appear at or near the projected portion of said film strip to determine the current time interval of said moving film strip;

(c) selecting a group of preselected memory stored digital control signals in response to said determined current time interval, said memory stored signals each including a select code identifying one of a plurality of output blocks, each block controlling one or more of said devices, and an instruction code identifying the control function said output block is to perform on said device or devices;

(d) cycling said memory stored digital control signals of said selected group in a preselected sequence over a period of

time generally corresponding to said time interval and determined by the number of stored digital control signals in said selected group to direct said digital signals to said output blocks; and



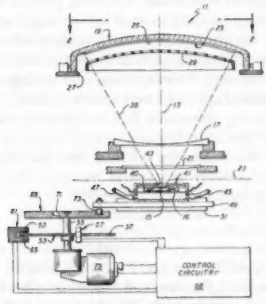
(e) causing said code selected output block of each digital control signal to perform said control function of said instruction code of said digital signal.

4,256,390

CATHODE RAY TUBE SCREEN EXPOSURE SYSTEM

Gary J. Fisher, Emporium; James E. Morean, Coudersport; Perley F. Simmons, and Steven N. VanGorden, both of Emporium, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 20, 1980, Ser. No. 132,068
Int. Cl.³ G03C 5/00
U.S. Cl. 354—1 **10 Claims**



1. An improvement in an exposure system for photo-forming a stripe-patterned screen for an in-line gun color cathode ray tube, said system utilizing a defined linear source of radiant energy for selectively photoexposing the sensitized inner surface of the tube viewing panel through a spatially related multi-opening mask member and a conjunctively positioned light refractive medium, said improvement relating to adjustable means for predeterminately oscillating said source of radiant energy, said means comprising:

a substantially planar control disk having a fixed center shaft therethrough, and evidencing a multitude of similar equi-spaced index apertures arranged in an orderly arcuate linear manner near the periphery thereof, and at least one control aperture oriented near said linear arrangement of index apertures but not in linear relationship therewith;

a positionally-adjustable reset probe in the form of a photo-sensing unit oriented at a location adjacent said disk to respond to associated light energy beamed through said disk control aperture thereby providing controlling electronic pulses;

a positionally-adjustable index probe in the form of a photo-sensing unit oriented at a location adjacent said disk spatially removed from said reset probe, said index probe being in a position to respond to associated light energy beamed through said index apertures as they move thereacross thereby providing index electronic pulses;

a cam member associated with said control disk and affixed to said center shaft at a position adjacent said control disk, said member having a definitive surface of discretely shaped contour;

cam follower means formed to mate with said cam contour in a manner to translate cam motion into reciprocating movement;

slide means and companion support means positioned relative to said cam follower and fashioned to accommodate said source of radiant energy, said slide being attached to said cam follower means to receive the reciprocating movement imparted therefrom;

motor means attached to said center shaft to provide a degree of rotary motion thereto; and

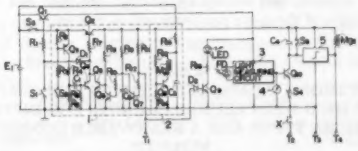
electric power source means and associated electronic control circuitry, said circuitry reading the input of said controlling and index electronic pulses from said probes with reference to adjustable index counting means and related switching control means, said circuitry effecting controlled rotary movement of said motor and related disk and cam members with repetitive reversal of directional rotation thereof, thereby achieving predetermined oscillation of said radiant energy source.

4,256,391

FLASH RESPONSIVE EXPOSURE TIME CONTROL SYSTEM

Mashio Kitaura, Tondabayashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1979, Ser. No. 69,854
Claims priority, application Japan, Aug. 30, 1978, 53-106570
Int. Cl.³ G03B 7/16
U.S. Cl. 354—33 **18 Claims**



1. In a combination of a camera and an electronic flash device, an exposure time control system comprising:

a shutter control circuit including an electromagnetic means for initiating a shutter closure upon deenergization thereof;

a power supply means actuatable in response to a manual

operation for energizing said shutter control circuit and said electromagnetic means;

a self-maintaining means for maintaining the actuated condition of said power supply means subsequent to the cessation of said manual operation, said self-maintaining means being made operative in response to the actuation of said power supply means;

a synchro switch for triggering a flash firing in conjunction with a camera shutter operation;

means for generating a control signal in response to the operation of said synchro switch; and

means for releasing the self-maintenance of said actuated condition of said power supply means in response to said control signal such that the shutter is closed in response to flash triggering by deenergization of said electromagnetic device.

4,256,392

SELF-DEVELOPING CAMERA

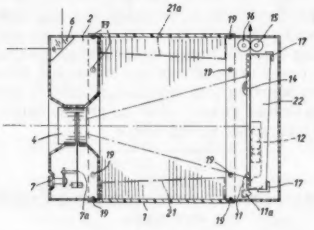
Otto Stemme, Munich, and Frank Staudacher, Haan, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1979, Ser. No. 70,844

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838286

Int. Cl.³ G03B *17/52*

U.S. Cl. 354—86 **14 Claims**



1. A self-developing camera, comprising a housing, including a front part provided with a lens and shutter, a rear part provided with a film transporting mechanism, and an intermediate part connecting said front and rear parts to one another and having a circumferential wall provided with an inner exposed surface bounding a permanently unobstructed interior through which exposure light travels in a path from said front part to said rear part; first means in said rear part for holding a film pack in picture-taking position in which a film sheet of the film pack is located in the imaging plane of said lens; and second means on said surface for holding at least one spare film pack adjacent said surface away from said path and with no film sheet of the spare pack exposed to imaging.

4,256,393

ELECTRONIC FLASH ATTACHMENT FOR CAMERAS, PROVIDED WITH PLURAL CIRCUITS FOR DIFFERING CAMERA TYPES AND A REMOVABLE CONNECTOR MODULE

Rolf Dietrich, Hofheim; Heinz Häfner, Nuremberg, and Wolfgang Pecher, Forchheim, all of Fed. Rep. of Germany, assignors to Metz Apparatewerk Inh. Paul Metz, Fürth, Fed. Rep. of Germany

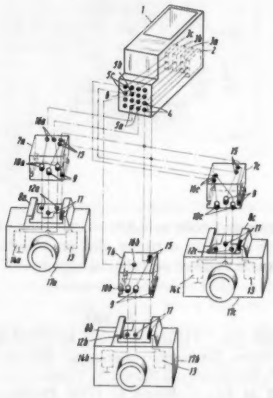
Filed Oct. 5, 1979, Ser. No. 82,411

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856092

Int. Cl.³ G03B *15/03*

U.S. Cl. 354—145 **14 Claims**

1. An electronic flash attachment accommodating a plurality of differing electrical circuits different ones of which are intended for use with cameras of differing types, the flash attachment including a contact socket having a plurality of contact-socket spring-contact elements which are connected to different respective ones of the plurality of differing electrical circuits, the flash attachment furthermore including a removably mounted connector module intended for use with cameras of one type and removable from the flash attachment to permit replacement of the connector module by a different connector module when the flash attachment is to be used with a camera of different type, the removable connector module having a first portion which engages the contact socket of the flash attachment and being provided with first contact elements so spatially arranged that when the first portion engages the contact socket the first contact elements form electrical connections with the contact-socket contact elements of those of the differing electrical circuits which are to be used with cameras of the type for which the removable connector module is intended, the removable connector module having a second portion configured to be received in the flash-attachment mounting shoe of cameras of the type for which the removable connector module is intended and being provided with second contact elements spatially located and arranged so as to electrically engage the electrical contacts with which the mounting shoes of such cameras are provided, said contact socket having a wall provided with openings, and said spring contacts comprising cylindrical spiral springs accommodated in the contact socket and having respective first end portions bent to project out from the openings for engagement with the first contact elements of the connector module and having second end portions conductively connected to respective ones of the plurality of differing electrical circuits.



4,256,394

CAMERA AUTOMATIC FILM WINDING DEVICE

Keisuke Haraguchi, Ranzan, and Susao Nakamura, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 57,147

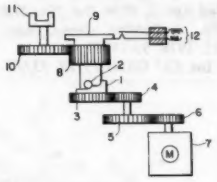
Claims priority, application Japan, Jul. 27, 1978, 53-103332[U]

Int. Cl.³ G03B *1/18*

U.S. Cl. 354—173 **5 Claims**

1. In an automatic film winding device in a camera having a camera wind coupling coupled to a motor drive through a power transmission mechanism having a cam and a follower, the improvement comprising: said cam having a first cam surface for maintaining a motor drive circuit energized and a second cam surface for a film winding operation in said camera, wherein following a shutter release operation in said camera said motor drive circuit is energized and said follower is

displaced to said first cam surface by the relative motion of said first cam surface and follower caused to be displaced to said second cam surface by the further rotation of said motor, said motor drive circuit maintained energized until the completion



of a winding operation in said camera whereby said second cam surface is disengaged from said follower by the relative motion of said cam second surface and follower to deenergize said motor drive circuit.

4,256,395

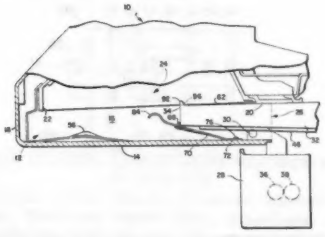
FILM CASSETTE SUPPORT SPRING

Bruce K. Johnson, Andover, and John B. Morse, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 30, 1979, Ser. No. 61,944

Int. Cl.[3] **G03B** *19/10, 17/00, 17/26*

U.S. Cl. 354—180 **6 Claims**



1. Photographic apparatus comprising:

means for defining a film chamber having an open end through which a film cassette is adapted to be inserted during the loading of the film cassette into said film chamber;

a film loading door mounted adjacent said open end of said film chamber for movement between open and closed positions; and

support means secured to a wall of said film chamber so as to extend in cantilever fashion away from said wall and said open end, said support means being mounted in the path of travel of a film cassette as it is being inserted into said film chamber via said open end for resiliently urging a film cassette of a first configuration into a position within said film chamber whereat a film unit located within the film cassette may be positioned for exposure and said door may be moved into said closed position, and for preventing a film cassette of a second configuration from being so positioned, said support means including film cassette engaging means adapted to engage a film cassette of the second configuration by an end wall so as to preclude the full insertion of the film cassette into said film chamber, and resilient means for moving said film cassette engaging means in response to being engaged and deflected by a film cassette, said resilient means being adapted to be engaged and deflected during the insertion of a film cassette of the first configuration through a distance sufficient to move said film cassette engaging means out of the path of travel of the film cassette thereby permitting the full insertion of the film cassette into the film chamber, said resilient means also being adapted to be engaged and deflected during the insertion of a film cassette of the second configuration through a distance insufficient to move said film cassette engaging means out of the path of travel whereby said film cassette engaging means engages the film cassette of the second configuration by the end wall and prevents its full insertion into the film chamber thereby precluding the movement of said door into said closed position.

4,256,396

CAMERA VIEWFINDER DEVICE

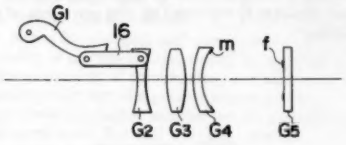
Taizo Kawaguchi, Amagasaki, and Haruo Kobayashi, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1978, Ser. No. 952,232

Claims priority, application Japan, Oct. 19, 1977, 52-140911[U]

Int. Cl.[3] **G03B** *13/10;* **G02B** *15/02*

U.S. Cl. 354—222 **12 Claims**



1. In a camera, a viewfinder having an optical axis and comprising at least one positive lens located on said optical axis, a pair of first and second negative lenses and transfer means for transferring said negative lenses alternatively to a first condition with said first and second negative lenses registering with said optical axis at predetermined respective first positions thereon and a second condition with said first negative lens in a second position out of registry with said optical axis and said second negative lens in a second position axially displaced from its respective first position, said first negative lens being supported for swinging between its first and second positions and said second negative lens being axially movable and said transfer means including means for moving a predetermined one of said negative lenses between its first and second positions and means directly intercoupling said first and second negative lenses to effect the driving of the other of said negative lenses between its first and second positions by the movement of said predetermined negative lens.

4,256,397

PHOTOGRAPHIC SHUTTER

Bernd Streller, Fürstenwalde, and Heinz Lehmann, Lauenstein, both of German Democratic Rep., assignors to Veb Elektronische Erzeugnisse Bärenstein, Bärenstein, German Democratic Rep.

Filed May 3, 1979, Ser. No. 35,542

Int. Cl.[3] **G03B** *9/18*

U.S. Cl. 354—250 **3 Claims**

1. A photographic shutter comprising:

a support plate formed with a window;

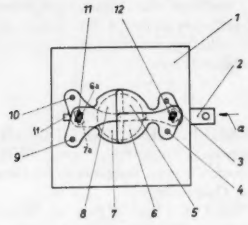
four sectors disposed on one side of said support plate;

an actuating element on the opposite side of said support plate rectilinearly shiftable thereon and formed with an actuating tongue, an opening through which said window is exposed in all positions of said element, a pair of arms straddling said window, and a connecting piece interconnecting said arms opposite said tongue;

a first set of at least two pivot pins each pivotally connecting said sectors to said plate whereby said sectors are each swingable about the pivot pins of said first set between a

position in which said sectors clear said window and a position wherein said sectors overlie and collectively block said window; and

a second set of at least two pivot pins pivotally connecting said sectors to said actuating elements at locations spaced



from the pivot pins of said first set for swinging said sectors between said positions upon displacement of said elements, said plate being formed with respective slots extending in the direction of displacement of said element and respectively traversed by said pivot pins of said second set.

4,256,398

DOUBLE SURFACED DEVELOPING TANK

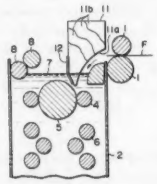
Masami Ohtani, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 30, 1979, Ser. No. 25,403

Claims priority, application Japan, Apr. 12, 1978, 53/47965[U]

Int. Cl.³ G03D *3/08*

U.S. Cl. 354—320 **4 Claims**



1. A film developing tank having a conveyor means which comprises a guide member having front and rear surfaces, feeding rollers by which a film to be developed is fed along the front surface of said guide member to introduce said film into developing liquid in said developing tank, and squeezing rollers for squeezing said film characterized in that:

said guide member is made of a plurality of spaced-apart guide plates each of which has a rear edge and an arc-shaped front edge along which said film is fed into the developing liquid to define a guiding surface for said film; and

a partition plate is attached to the rear edges of said guide plates and extends completely across the developing tank to divide the horizontal section of said tank and surface of the developing liquid therein.

4,256,399

ELECTROPHOTOGRAPHIC COPYING APPARATUS EQUIPPED WITH IMPROVED BRAKING DEVICE FOR SCANNING SYSTEM

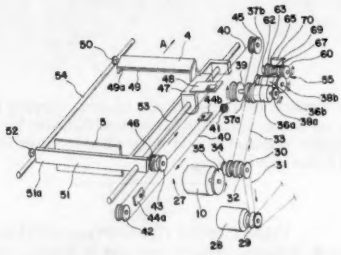
Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

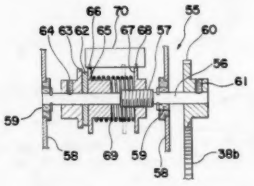
Filed Apr. 3, 1979, Ser. No. 27,015

Claims priority, application Japan, Apr. 10, 1978, 53-47319[U]; Apr. 15, 1978, 53-44707

Int. Cl.³ G03G *15/28, 15/32*

U.S. Cl. 355—8 **3 Claims**





1. An electrophotographic copying apparatus which comprises an original platform of transparent plate material, an optical system having a light source for illuminating an original to be copied from beneath said original platform and reflecting mirrors and a lens assembly for directing a light image of the original illuminated by said light source onto a photoreceptor, and scanning means for scanning the original including a driving mechanism for relatively moving said optical system and said original platform, said scanning means further including a braking device having:

(a) a brake shaft rotatably disposed in said driving mechanism for the scanning system,

(b) spring means which is mounted on said brake shaft for applying a maximum braking force at a scanning starting position, and

means for causing said spring means to gradually attenuate the braking force during the scanning.

4,256,400

COPYING MACHINE PROVIDED WITH MEANS FOR SELECTIVELY SETTING ORIGINAL BASE LINE

Shigehiro Komori, Yokohama, and Hajime Katayama, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1978, Ser. No. 948,401

Claims priority, application Japan, Oct. 8, 1977, 52-121176; Apr. 28, 1978, 53-51843

Int. Cl.³ G03G *15/00*

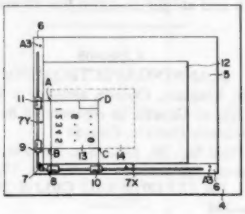
U.S. Cl. 355—14 SH **13 Claims**

1. A copying machine capable of setting an original refer-

ence line which defines an area to be copied for a document placed at any position on the original placement surface of the machine, said copying machine comprising:

an original table having an original placement surface on which a document is placed;

optical means including a lens for projecting an image of the document placed on said original placemnt surface;



means for visualizing the image;

means for determining an original reference line on said original placement surface; and

means for controlling the feeding of copy material in response to a signal from said determining means.

4,256,401

IMAGE DENSITY ADJUSTMENT METHOD AND APPARATUS

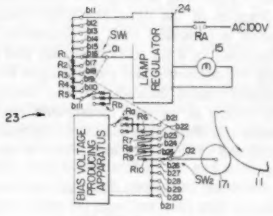
Itaru Fujimura, Tokyo; Hitoshi Nakamura, Kawasaki; Shoji Kuroishi, Yokohama; Nachio Seko, Sagamihara, and Toshiyuki Ogawa, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jan. 8, 1979, Ser. No. 1,407

Claims priority, application Japan, Jan. 18, 1978, 53/4084

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 E **8 Claims**



1. The method of adjusting the image density of images in electrophotographic copying apparatus comprising a photoconductor, exposure control means, and development bias means, said method comprising increasing the development bias potential while maintaining substantially constant the exposure to be applied to the photoconductor when copies having an image density lower than a predetermined standard image density are made, and decreasing the exposure while keeping the development bias potential substantially constant when copies having an image density greater than said predetermined image density are made.

4,256,402

METHOD AND APPARATUS OF DETECTING TONER CONCENTRATION OF DRY DEVELOPER

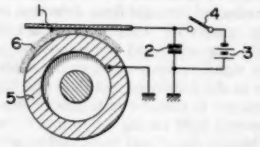
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Aug. 23, 1978, Ser. No. 936,081

Claims priority, application Japan, Sep. 1, 1977, 52/104159

Int. Cl.³ G01N *33/28, 21/55;* G03G *15/00*

U.S. Cl. 356—38 **13 Claims**



1. In a toner concentration determining apparatus including an electrically chargeable conductive member which, when charged, attracts toner from dry developer, including said toner and carrier, the improvement comprising at least one capacitor, means for charging said capacitor with a predetermined quantity of electric charge, means for transferring said predetermined quantity of electric charge of said capacitor to said conductive member, the predetermined quantity of electric charge of said conductive member having a magnitude and polarity selected such that said charged conductive member attracts said toner from said dry developer in an amount representative to the toner concentration thereof.

4,256,403

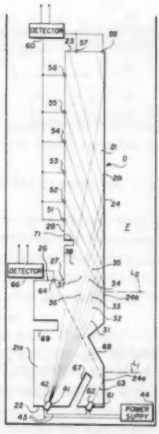
COMBINATION WATER CONTAMINANT AND FUEL DENSITY DETECTOR

Frederic D. Powell, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,513

Int. Cl.³ G01N *21/00, 21/41, 21/84*

U.S. Cl. 356—73 **16 Claims**



1. A water/fuel density detector for a fuel tank or the like comprising, in combination, a longitudinally extending light-transmitting body adapted to be disposed within a fuel tank in an upstanding position with the bottom end of said body adjacent the bottom of said tank, said body having a substantially vertically extending side face forming an interface with the fluid in said tank, light-emitting means on the bottom end of said body for transmitting emitted light to said interface in the

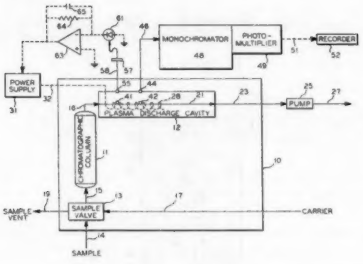
form of a group of divergent rays in angularly disposed light emission paths, said rays having successively increasing angles of incidence upwardly with respect to said interface, a plurality of vertically spaced light sensors mounted on an opposite side face of said body, each of said light sensors being arranged in optical communication with the light reflection paths of a respective one of said rays, said sensors being responsive to the reflected rays whose angle of incidence exceeds the critical angle corresponding to the index of refraction of said fluid in accordance with Snell's Law and non-responsive to said rays whose angle of incidence is below said critical angle and are thereby refracted into said fluid, detection means connected to said light sensors for detecting the dark-light boundary between said responsive and non-responsive sensors to produce an output signal corresponding to the index of refraction and therefore to the density of said fluid said light-emitting means being arranged to transmit an angularly disposed supplemental ray of emitted light having a terminus on said interface adjacent the bottom end of said body, said supplemental ray having an angle of incidence corresponding to at least the critical angle of water whereby said supplemental ray is reflected by the presence of water at said supplemental ray terminus, and a supplemental light sensor on said body opposite said side face arranged in optical communication with the reflection path of said supplemental ray for response to said reflected supplemental ray and wherein said detection means is connected to said supplemental light sensor for detecting the response of said supplemental light sensor to provide an output signal indicative of the presence of water at a level on said interface corresponding to said supplemental ray terminus.

4,256,404

OPTOELECTRONIC FEEDBACK CONTROL FOR A SPECTROMETER

Starnes E. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 28, 1979, Ser. No. 79,747
Int. Cl.³ G01N *21/68*
U.S. Cl. 356—316 **8 Claims**



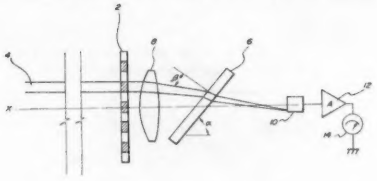
1. Apparatus comprising:
means defining a plasma discharge cavity;
means for providing a carrier gas and a sample gas to said plasma discharge cavity;
means for converting at least a portion of said carrier gas and said sample gas into a plasma inside said plasma discharge cavity;
means for detecting the energy associated with an atomic emission line of said carrier gas;
means for establishing a feedback control signal which is responsive to the level of the detected energy associated with said atomic emission line of said carrier gas;
means for manipulating said means for converting at least a portion of said carrier gas and said sample gas into a plasma in response to said feedback control signal to thereby maintain the level of the detected energy associated with said atomic emission line of said carrier gas substantially constant;
means for detecting the energy associated with an atomic emission line of said sample gas; and
means for establishing an output signal which is representive of the concentration of a particular element in said sample gas in response to the level of the detected energy associated with said atomic emission line of said sample gas.

4,256,405

SCANNING SPECTROMETER

Earl J. Fjarlie, Kingston, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ontario, Canada

Filed Sep. 20, 1978, Ser. No. 944,139
Claims priority, application Canada, Jan. 13, 1978, 294932
Int. Cl.³ G01B *9/02*; G01J *3/28*
U.S. Cl. 356—346 **4 Claims**



1. In a spectrometer for analyzing a spectrum of light from a source, the spectrometer having a slit assembly for isolating a certain input flux along an optical axis, dispersion means for dispersing that flux into its constituent wave length parts, shutter means for passing the light to the dispersion means through sequentially spatially varied locations in the shutter means, and a recording detector for identifying and recording spectral features of the light, the improvement wherein the spectrometer is provided with an electronic scanner shutter means consisting of a liquid crystal cell, and with cylindrical lens means for receiving and passing light from such sequentially spatially varied locations of the shutter means to the dispersion means at varying measurable angles of incidence and wherein the dispersion means comprises an interference filter positioned at a known angle to the optical axis of the input flux.

4,256,406

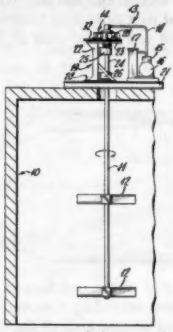
AGITATOR AND DRIVING MEANS THEREFOR

Robert L. Somerville, Old Amwell Rd., Rte. 1, Box 256, Neshanic, N.J. 08853

Filed Sep. 19, 1979, Ser. No. 77,128
Int. Cl.³ B01F *7/20*
U.S. Cl. 366—279 **10 Claims**

1. Driving means for an agitator having a tank and a vertical agitator shaft carrying agitating means disposed within the tank comprising a vertically disposed intermediate shaft rotatably supported in alignment with said agitator shaft, means for coupling said agitator shaft to one end of said intermediate shaft, a drive motor having a driven shaft extending down-

wardly therefrom, means for supporting said motor with said driven shaft in axial alignment with the other end of said intermediate shaft, and second coupling means carried by said other end of said intermediate shaft engaging said driven shaft, said



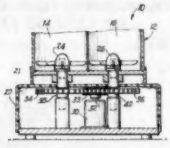
motor supporting means permitting restricted displacement of said motor in a plane normal to said driven shaft to compensate for displacement of the last said engaging means produced by bending moments caused by rotation of said agitator.

4,256,407

CULINARY MIXER AND DISINTEGRATOR

Maurice Seiderman, 3306 Deronda Dr., Hollywood, Calif. 90068

Filed Dec. 16, 1975, Ser. No. 641,165
Int. Cl.³ B01F *7/00, 15/00*
U.S. Cl. 366—300 **6 Claims**



1. A high-speed blending device adapted for receiving material to be blended, comminuted, or liquefied, said device comprising:

(a) a container body having a lobular cavity, defined by upstanding side walls and a bottom wall, for receiving said material, said cavity having a cross-section of generally Figure-8 configuration and defining a pair of distinct, overlapping lobes for semi-independent agitation zones;

(b) a single communitor/blender blade member assembly rotatably disposed in each of said lobes proximate said bottom wall, said assembly consisting essentially of a plurality of coaxially and commonly circumferentially mounted individual blade members, each of said blade member assemblies being rotatably movable on a path in essentially the same horizontal plane, and each such path being non-overlapping with respect to the other; and

(c) said container body (a) together with said comminutor/-blender blade member assemblies (b) defining means for cooperatively insuring vortex and non-bridging flow of said material therein.

4,256,408

DOT MATRIX PRINT HEAD

Thomas F. Shelton, Lauderdale Lakes, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

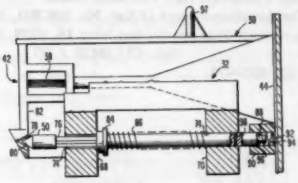
Filed Jul. 30, 1979, Ser. No. 62,256
Int. Cl.³ B41T *3/12*
U.S. Cl. 400—124 **10 Claims**

1. Apparatus for removably mounting a dot matrix print head in yoke means comprising:

at least one support member having means adapted to receive engagement means which is to be held in a stationary position against said yoke means;

hole means in said yoke means through which said support member is movably positioned;

a pair of receiving means in said print head for receiving opposite ends of said support member to mount said print head to said yoke means; and



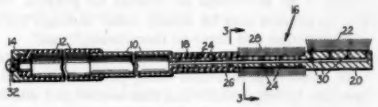
spring means within one of said receiving means for maintaining one end of said support member removed from the back of that one receiving means and for being compressed to allow the other end of said support member to be removed from the other of that pair of receiving means whenever said engagement means is held in said stationary position.

4,256,409

IMPLEMENT FOR CLEANING THE FEET

Douglas C. Manley, 16045 SE. Clatsop, Portland, Oreg. 97236

Filed Jun. 1, 1979, Ser. No. 44,527
Int. Cl.³ A46B *11/02*
U.S. Cl. 401—24 **3 Claims**



1. An implement for cleaning the feet comprising

(a) an elongated hollow body member having upper and lower ends,

(b) said body member being arranged to receive a cleaning solution,

(c) a rod-like extension on the lower end of said body member having a resilient exterior cylindrical cleaning portion of a cross sectional dimension allowing it to be worked between the toes for cleaning such areas,

(d) said rod-like extension also including a cylindrical brush having radial bristles,

(e) said brush being in axial alignment with said cylindrical cleaning portion and also being of a cross sectional dimension allowing it to be worked between the toes,

(f) passageway means in said rod-like extension communicating with said hollow body member and leading to said resilient exterior cleaning portion and to said cylindrical brush whereby cleaning solution can be fed from said body member to said resilient exterior cleaning portion and to said cylindrical brush,

(g) said body member having a flexible portion which when squeezed inwardly is arranged to force cleaning solution through said passageway means to said resilient exterior cleaning portion and to said cylindrical brush,

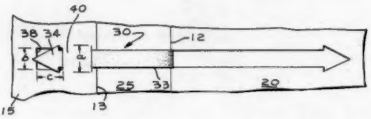
(h) and a cross brush secured on the lower end of said rod-like extension for cleaning surfaces of the feet.

4,256,410
Patent Not Issued For This Number

4,256,411
FILE FOLDER WITH INTEGRAL LOOSE LEAF BINDER RINGS

Edward Podosek, Wilbraham, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Continuation-in-part of Ser. No. 969,801, Dec. 15, 1978, abandoned. This application May 16, 1979, Ser. No. 39,584
Int. Cl.³ B42F *3/00*
U.S. Cl. 402—73 **2 Claims**



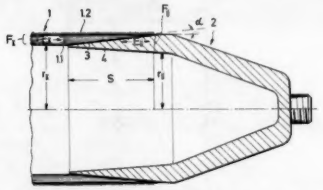
1. A loose leaf folder comprising:
(a) a unitary sheet of flexible plastic sheet material formed to include a pair of hinged cover panels;
(b) said panels being struck at spaced locations adjacent the hinges thereof to provide a plurality of ring binder forming strips, each strip being attached to one of the panels at an inner end adjacent the hinges, said strip including a free end with an enlarged tip portion of arrowhead configuration;
(c) the other of said panels having narrow slits parallel to the hinges and an aperture spaced outwardly of each slit, one such slit and panel aperture being disposed in registered alignment with each ring binder strip for receiving the enlarged tip thereof when the strips are reversibly bowed from one panel toward the other panel;
(d) each of said slits having a length greater than the largest width of its associated arrowhead tip portion, whereby the tip portion may be readily fitted through the slit for easy insertion and removal therethrough; and
(e) each of said apertures being substantially rectangular with two marginal edges being parallel to the slit, said aperture having a width less than said largest width of the arrowhead portion and a length less than the axial length of said arrowhead portion measured from arrowhead tip to arrowhead base, whereby the arrowhead tip portion may be quickly and easily fitted through the aperture and removably locked in place.

4,256,412
ROD-SHAPED CONNECTING ELEMENT

Gerd Tybus, Poing, and Hilmar Laube, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,370
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855570
Int. Cl.³ F16B *11/00*
U.S. Cl. 403—267 **11 Claims**

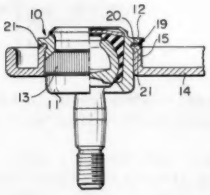
1. Rod-shaped connecting element comprising an axially extending fiber-reinforced plastics material part having at least one layer of unidirectional fibers, and at least one axially extending transition element for introducing forces into said plastics material part in the direction of said unidirectional fibers, said plastics material part having a tapered portion, said transition element having a tapered portion with said tapered portions being arranged one overlapping the other, and at least one adhesive layer located between and securing said tapered portions together, wherein the improvement comprises that the overlapped connection of said plastics material part and transition element has a first end and a second end, said plastics material part extends outwardly from said first end of the overlapped connection and said transition element extends outwardly from the second end and the cross sectional areas of said plastics material part extending transversely of the direction between the first and second ends of the overlapped connection at the first end of the overlapped connection and of said transition element extending transversly of the direction between said first and second ends of the overlapped connection at the second end of the overlapped connection are inversely proportional to the modulus of elasticity of said plastics material part and said transition element in the direction of the introduced forces extending in the direction between the first and second ends of said overlapped connection.



4,256,413
STRUCTURE FOR MOUNTING BALL JOINT

Michio Abe, Kasugai, Japan, assignor to Tokai TRW & Co. Ltd., Kasugai, Japan

Filed Nov. 7, 1977, Ser. No. 848,943
Claims priority, application Japan, Dec. 29, 1976, 51-160381
Int. Cl.³ F16B *17/00*
U.S. Cl. 403—282 **1 Claim**



1. In a ball joint mounting structure for mounting a ball joint in one of two structural members adapted to be joined together by said ball joint, said one structural member having a cylindrical portion, said ball joint having a hollow cylindrical housing press fitted into said cylindrical portion, characterized in that a self-caulking engaging means is provided between said housing and said cylindrical portion for automatically caulking said housing and said cylindrical portion as said housing is being press fitted into said cylindrical portion, and that said self-caulking engaging means comprises a groove formed in the outer surface of said housing and a wall portion of said cylindrical portion snugly received in said groove as said housing is being press fitted into said cylindrical portion, said housing having a knurled portion, said annular groove having a width substantially corresponding to the wall thickness of said cylindrical portion and an outer diameter substantially corresponding to the outer diameter of said cylindrical portion and inclined in frusto-conical form and the effective diameter of said knurled portion in the housing substantially corresponding to the inner diameter of said cylindrical portion, whereby as said housing is being press fitted into said cylindrical portion, the inner surface of said cylindrical portion is caused to plastically deform in conformity with the contour of said knurled portion until said opening edge is snugly received in said annular

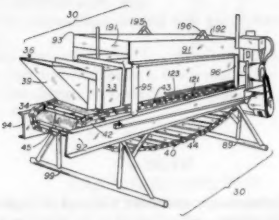
groove to thereby cause said housing and cylindrical portion to come into sealing contact with each other.

4,256,414

ASPHALTIC CONCRETE RECYCLING APPARATUSES, PROCESS AND SYSTEM

James L. Milligan, 5001 Camp La., Amarillo, Tex. 79110

Filed Jan. 25, 1979, Ser. No. 6,275
Int. Cl.³ E01C *23/14*
U.S. Cl. 404—79 **11 Claims**



5. A process of treating weathered embrittled asphalt concrete located in a roadbed portion comprising a mixture of asphaltic concrete by:

(a) first removing embrittled asphaltic concrete from its location on the roadbed in the form of dimensionally stable generally flat slabs of asphaltic concrete, said slabs each 1 to 3 inches thick and 6 to 12 inches wide and 6 to 12 inches long;

(b) passing such slabs onto a support plate within a heater chamber and moving said slabs through such chamber while heating them by directing flames at the walls and roof of said heater chamber whereby said slabs are heated by radiation and in a neutral atmosphere and thereby

(c) raising the temperature of the asphaltic concrete until the asphalt component thereof melts and decomposes the initially dimensionally stable slabs into a flowable mass of discrete particulate agglomerates at a temperature below 200° C. and passing hot gasses from said chamber with negligible contact with said mass, each of said particulate agglomerates comprising a mass of aggregate with an asphaltic covering thereon, and then adding asphalt rejuvenating material to said mass, then

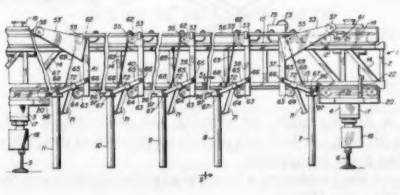
(d) passing such rejuvenated mixture of asphalt and aggregate to a zone of the roadbed whereat such rejuvenated asphaltic concrete mix is applied.

4,256,415

CONCRETE VIBRATOR MACHINE

Murray A. Rowe, Canton; Robert T. Conway, Rapid City, both of S. Dak.; Herbert C. Glesmann, Omaha, and Richard W. Kruse, Fort Calhoun, both of Nebr., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Oct. 19, 1979, Ser. No. 86,416
Int. Cl.³ E01C *19/38*
U.S. Cl. 404—116 **16 Claims**



1. A concrete vibrator machine for vibrating concrete disposed on a longitudinally extending area, said machine comprising

a. an elongated supporting frame adapted to extend laterally across such an area,

b. supporting means mounted on the opposite ends of said supporting frame for transporting said supporting frame longitudinally of such an area,

c. a plurality of other supporting means mounted on said supporting frame for movement longitudinally of the latter,

d. vibrator means mounted on respective ones of said other supporting means,

e. means for moving said vibrator means downwardly and upwardly relative to said respective ones of said other supporting means into and out of such concrete, and

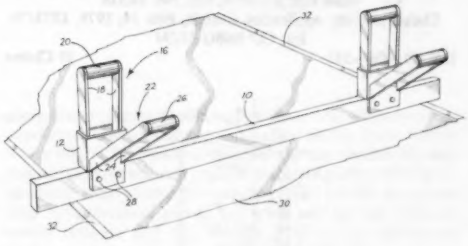
f. means for moving said other supporting means longitudinally of said supporting frame.

4,256,416

SCREED FOR LEVELING FRESHLY POURED CONCRETE

Roy I. Bishop, 5140 Yelm Hwy., Olympia, Wash. 98503

Filed May 14, 1979, Ser. No. 38,410
Int. Cl.³ E01C *19/22*
U.S. Cl. 404—119 **2 Claims**



1. A screed for leveling freshly poured concrete, comprising:

(a) an elongated leveling bar, and

(b) a pair of handle assemblies secured releasably to the leveling bar one adjacent each end of the latter, each handle assembly comprising:

(1) a body secured releasably to the leveling bar,

(2) a first handle secured to the body and extending vertically upward from the leveling bar, and

(3) a second handle secured to the body and extending laterally and upwardly from the levelling bar.

4,256,417

VARIABLE STIFFNESS LOWER JOINT FOR PIPE RISER WITH FIXED BOTTOM

John M. Bohannon, Houston, Tex., assignor to Conoco, Inc., Ponca City, Okla.

Filed Nov. 3, 1978, Ser. No. 957,653
Int. Cl.³ E02D *21/00*
U.S. Cl. 405—195 **19 Claims**

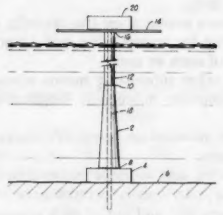
1. A structural member, comprising:

a first surface;

a second surface in spaced relation to said first surface;

a third surface extending between, joining to, and circumscribing said first and second surfaces, said third surface having a continuous curvilinear taper from said second surface to said first surface, said continuously curvilinearly tapered third surface being further characterized as a means for providing a substantially constant resultant stress in said structural member between said first and second surfaces for a given axial load, shear load and bending moment at said first surface, said resultant stress

being defined as a sum of an outer fiber bending stress and an axial stress; and



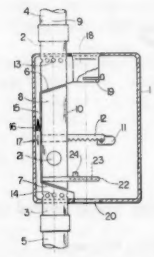
a fourth surface disposed concentrically within said third surface and extending between and joining to said first and second surfaces, said fourth surface being a constant diameter cylindrical inner surface.

4,256,418

ROHRPOSTSTATION (PNEUMATIC-TUBE STATION)

Wilfried Stangl, Salzburg, Austria, assignor to Aerotrans Rohrpostanlagen Gesellschaft m.b.H., Salzburg, Austria

Filed Feb. 23, 1979, Ser. No. 14,516
Claims priority, application Austria, Feb. 24, 1978, 1373/78
Int. Cl.³ B65G *51/34*
U.S. Cl. 406—112 **10 Claims**



1. A pneumatic tube station, comprising

a continuous delivery tube defining two coaxially facing ends and an interrupted space therebetween,

a displaceable tube portion which can be moved out of the interrupted space of the continuous delivery tube, and respectively, which can be inserted in the interrupted space into the delivery tube, said continuous delivery tube with said tube portion in said interrupted space communicating simultaneously with said two ends being adapted for passage therethrough of pneumatic-tube carriers,

one seal means each for connecting each respective end of the displaceable tube portion in the position inserted into the delivery tube with the delivery tube,

a slider slidably disposed in the vicinity of one end of said displaceable tube portion, said slider air-tightly sealingly closes said displaceable tube portion when the slider is in an inserted condition therein,

means comprising an air channel extending by-passingly exterior to said tube portion and communicatingly connects said two ends of the delivery tube,

a storage hopper and a discharge opening spaced axially apart from each other,

said displaceable tube portion in its position in which it is moved out of the delivery tube is arranged between said storage hopper and said discharge opening,

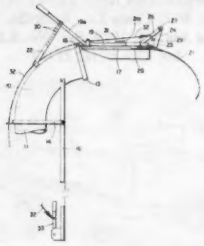
a blocking means for blocking said storage hopper.

4,256,419

ENDPLATE STOP FOR SILAGE DISTRIBUTOR

John R. Haan, R.R. #1, Box 95B, Mulberry, Ind. 46058

Filed Dec. 14, 1979, Ser. No. 103,456
Int. Cl.³ B65G *53/52*
U.S. Cl. 406—161 **4 Claims**



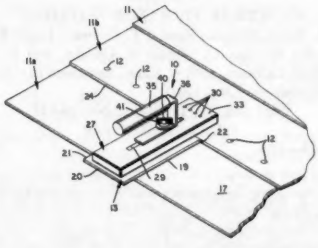
1. In a silage distributor assembly adapted to deposit silage or the like within a silo, said assembly being of the type having a gooseneck fill tube and a spreader plate extending into the silo interior and having a curved deflector plate hinged to the free end of the spreader plate for cooperation therewith in distributing silage issuing from the fill tubee, wherein the improvement comprises an actuating member providing remote movement of the deflector plate about its hinge between a raised position in which the deflector plate is substantially out of the silage flow path and a lowered position in which it directly intersects the silage flow path, a linkage assembly interconnecting said deflector plate and said actuating member, said linkage assembly including an element moveable in a rectilinear path when the kinetic energy of the silage flow moves said deflector plate toward its raised position and moveable in an arcuate path as the deflector plate is moved to its raised position by said actuating member, and a stationary stop abutment engaged by said element as it moves in its rectilinear path to limit the movement of the deflector plate by the kinetic energy of the silage flow, said element clearing said stop abutment as it moves in its arcuate path when said deflector plate is moved to its raised position by said actuating means.

4,256,420

NAIL HEAD DRILLING GUIDE

Claude Day, P.O. Box 431, Blakely, Ga. 31723

Filed Jan. 22, 1979, Ser. No. 4,994
Int. Cl.³ B23B *49/00*
U.S. Cl. 408—115 R **2 Claims**



1. A drilling guide for aligning and stabilizing a drill bit while drilling out the heads of nails set in asbestos shingles, said drilling guide comprising:

a base plate including a forward edge for abutting against an edge of a shingle;

drill bit guide means positioned above said base plate and adjustably extendable beyond said forward edge of said

base plate and over the asbestos shingle, said drill bit guide means comprising a guide plate and a plurality of guide holes through which a drill bit is to be extended to engage a nail head set in the shingle, said guide holes being defined in said guide plate in alignment with said forward edge of said base plate;

each of said plural guide holes having the same diameter;

a countersunk portion surrounding each of said guide holes in confronting relation to the nail head being drilled, each of said countersunk portions being of mutually different diameter so as to accommodate nail heads of correspondingly different sizes; and

means for releasably securing said guide means to said base plate,

whereby said guide plate is adjustable relative to said base plate and said base plate is moveable along the edge of the asbestos shingle to position said guide hole in axial alignment with a nail head.

4,256,421

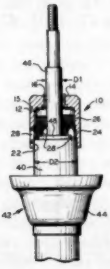
SELF-THREADING NUT

Kenneth D. Kloster, 6649 Millridge, Maumee, Ohio 43537

Filed Oct. 22, 1979, Ser. No. 86,785

Int. Cl.³ B23B *51/00*; B23G *5/00*; F16B *27/00*

U.S. Cl. 408—221 **8 Claims**



1. An apparatus for forming threads on the upper end of a cylinder of a shock absorber assembly having a piston rod axially extending from the upper end of the cylinder, said apparatus comprising: a main body including a hollow portion having thread forming means on the inner annular wall of the hollow portion terminating in an annular skirt portion for receiving the upper end of the cylinder having threads formed thereon, and an upper annular centering means formed in said main body for receiving the piston rod of the shock absorber, said centering means having an inner diameter substantially equal to the outer diameter of the piston rod for centering the apparatus as the same is rotated onto the cylinder during the thread forming operation.

4,256,422

DRILLING MACHINE WITH A DRILLING STOP

Werner Theissig, and Gerhard Teger, both of Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

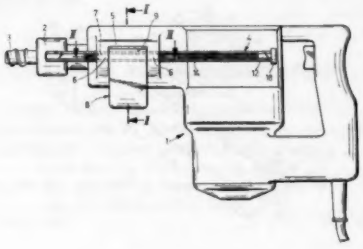
Filed Jul. 24, 1979, Ser. No. 60,235

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832429

Int. Cl.³ B23B *49/00, 45/14*

U.S. Cl. 408—241 S **9 Claims**

1. Drilling machine comprising a housing having a front end and a rear end and also having a drilling axis extending in the front end-rear end direction, means on the front end of said housing for mounting a drilling tool, a stop member mounted on and extending in generally parallel relation with the drilling axis of said housing for limiting the depth a tool mounted in said housing can drill into a receiving surface, mens for releasably locking said stop member on said housing so that the position of said stop member can be adjusted, said stop member comprising an axially elongated rod-like member, wherein the improvement comprises a handle lever pivotally mounted on said housing and having one end of said handle lever located adjacent to said stop member, a corrugated surface in operative relation with said handle lever and disposed in juxtaposition to said stop member, the pivotal axis of said handle lever extending generally parallel to the axis of said stop member, the one end of said handle lever being pivotally displaceable through an arc between a first position where said stop member is in the released position and a second position where said stop member is in the locked position, the one end of said handle lever having a surface extending circumferentially around and spaced radially outwardly from the pivotal axis, a continuous circumferential part of said one end surface being pivotally



displaceable relative to said stop member, the continuous circumferential part of said one end surface having a first portion which when it is positioned opposite said stop member the stop member is in the released position, a second portion having the maximum radial dimension from the pivotal axis for the continuous circumferential part so that when said second portion is spaced opposite said stop member it presses the corrugated surface against said stop member into tightly fitting engagement therewith, and a third portion having a radial dimension from the pivotal axis less than the maximum radial dimension of said second portion so that when it is spaced opposite said stop member it presses the corrugated surface into contact with said stop member for holding said stop member in the locked position and with the force exerted against said stop member being less than the force exerted by said second portion.

4,256,423

KEY CUTTING MACHINE

John Juskevic, 7228 Orchard, Dearborn, Mich. 48126

Filed Aug. 13, 1979, Ser. No. 65,933

The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.

Int. Cl.³ B23C *1/16*

U.S. Cl. 409—82 **5 Claims**

1. A key cutting machine for cutting the shaped edge on a key blank in accordance with a pre-determined coded shape, comprising:

a horizontally arranged, immovable first shaft mounted upon a support;

an L-shaped lever having a central opening through which said first shaft is journalled, with the lever being both pivotable and slidable relative to the first shaft and having a substantially horizontally extending arm and a substantially vertically extending arm relative to the shaft;

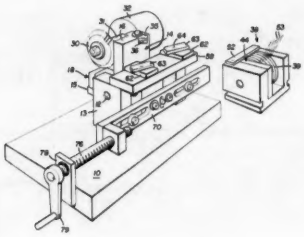
a key blank vise mounted upon the end portion of the horizontally extending arm for temporarily clamping a key blank upon the end of the horizontal arm with the edge of the blank arranged parallel to the first shaft axis;

a rotating cutting wheel arranged to rotate about an axis parallel to the first shaft axis, with the cutting wheel lo-

cated a short distance above the vise for engaging and cutting the key blank edge;

a stylus mounted upon the upper end of the substantially vertical arm, with said stylus normally engaging against a guide surface forming a horizontally extending guide path which is parallel to the first shaft axis so that the stylus moves transversely of the first shaft axis as it traverses the guide surface;

a guide means formed of a plurality of roughly circular disks rotatably mounted in axial alignment with each other on a second shaft having an axis which is parallel to the first shaft axis, and with the adjacent disks being positioned in a frame to hold said disks in substantial face to face contact with each other so that the disks together form a roughly cylindrical shape member formed of the separate disks;



each of said disks having a series of successively deeper steps formed on its peripheral edge along a portion of such edge and having indicia formed on remote portions of its edge, with the indicia corresponding to the successive steps;

means for rotating each disk about said second shaft axis to locate a predetermined step in alignment with the path of movement of the stylus to form a portion of the guide surface, with its corresponding indicia indicating the selection of that step, so that rotation of each disk aligns the pre-selected steps of each into the guide surface;

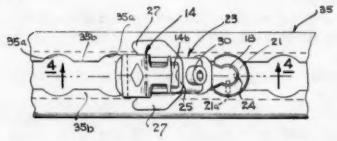
whereby movement of the lever along the length of the shaft causes the stylus to move transversely of the shaft because of its contact with the successive steps of each of the guide surface forming disks, to thereby pivot the lever and correspondingly move the key blank towards and away from the cutting wheel for cutting a desired edge shape upon the blank.

4,256,424

RATTLE-PROOF ANCHOR FITTING FOR SECURING LOADS TO A RETAINER TRACK

Howard T. Knox, Simi, and James E. McAtee, El Segundo, both of Calif., assignors to Ancra Corporation, El Segundo, Calif.

Filed Aug. 20, 1979, Ser. No. 67,775
Int. Cl.[3] B60P *7/08*; B61D *45/00*
U.S. Cl. 410—105 **3 Claims**



1. In an anchor fitting for securing loads to a retainer track, said track having a top surface, a longitudinal slot and spaced notch portions separated by neck portions formed by a pair of oppositely positioned flanges, the anchor fitting having a main body portion, a pair of pad members extending from said main body portion and positioned in the track slot under said pair of flanges and a latching plunger member slidably positioned on the main body portion and positioned in one of the track member notches, the improvement being means for clamping the fitting to said track to prevent rattling therebetween comprising:

a clamp member having a U-shaped portion and a pair of flange portions extending outwardly away from the ends of the "U" of the U-shaped portion, said flange portions having substantially flat bottom surfaces which are substantially parallel to the bottom surfaces of said pad members,

undercut portions in said fitting forming channels shaped to slidably receive the U-shaped portion of said clamp in mating relationship therewith, and

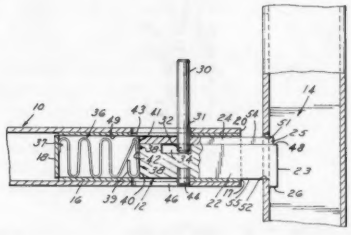
adjustment means fitted through the top wall of said U-shaped portion and engaging the main body of the fitting for use in moving the clamp in said channels towards the retaining track and driving the flange portions of said clamp member against the track, whereby the shoulders of said fitting are drawn against the inner surfaces of the track into tight engagement therewith.

4,256,425

LATCH ASSEMBLY FOR DUNNAGE BARS

Leonard G. Burgess, New Baltimore, and Richard E. Wroblewski, Roseville, both of Mich., assignors to Equipment Manufacturing, Inc., Warren, Mich.

Filed Mar. 12, 1979, Ser. No. 19,864
Int. Cl.[3] B61D *45/00*
U.S. Cl. 410—149 **10 Claims**



1. In a latch assembly for connecting an end of a dunnage bar to a support, the latch assembly including a connector member having an outer end provided with a laterally projecting locking lug, and a latch plate movable relative to the connector member, the outer end of the connector being positionable between a pair of opposed spaced portions of the support with the locking lug overlappingly engaging one of said portions and the latch plate being engageable with the other of said portions to prevent disengagement of the locking lug, the improvement wherein:

a tubular housing having an open end is adapted to be secured to the dunnage bar with the open end of the housing adjacent to an end of the dunnage bar;

the connector member and the latch plate are substantially coextensive in length and are slidably mounted in the housing with their outer ends extending therefrom, the connector member having a surface which is slidably engaged by the latch plate and which surface faces oppositely from the laterally projecting locking lug of the connector member, and a handle connected to the latch plate projects through a slot in the wall of the housing;

spring means positioned in the housing engages the inner ends of the connector member and the latch plate for normally urging their outer ends to extended positions relative to the open end of the housing;

motion limiting means acts between the connector member and the housing for limiting sliding movement of the connector member and defining the extended position thereof; and,

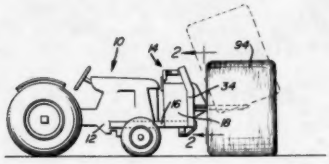
abutment means acts between the connector member and the latch plate for permitting limited relative sliding movement therebetween.

4,256,426

TRACTOR FRONT MOUNTED ROUND BALE CARRIER

Merle D. Buss, Box 36, R.R. 1, Fortuna, Mo. 65034

Filed May 16, 1979, Ser. No. 39,666
Int. Cl.[3] B60P *1/34*
U.S. Cl. 414—24.5 12 Claims



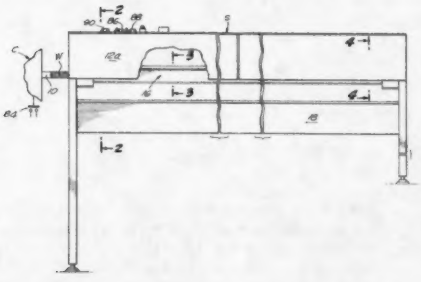
12. In combination with a farm vehicle including front and rear ends, an upright frame mounted on one of said ends and defining upstanding guide means, a follower supported from said guide means for guided up and down movement therealong, said follower including a horizontally outwardly projecting spear structure for spearing the central portion of a cylindrical hay bale toward which said one end of said vehicle is advanced, and thrust means connected between said follower and said frame for adjustably raising and lowering said follower along said guide means, said thrust means comprising an elongated hydraulic cylinder having one end thereof pivotally connected to said frame and the other end pivotally anchored relative to said follower, said other end of said cylinder being releasably pivotally connected to said follower and said frame including means defining an anchor point to which said other end of said cylinder may be releasably connected for storage purposes, said follower being upwardly disengageable from the upper ends of said channel members.

4,256,427

AUTOMATIC WIRE STACKER APPARATUS

Jayantilal S. Patel, El Monte, Calif., assignor to Eubanks Engineering Co., Monrovia, Calif.

Filed Feb. 26, 1979, Ser. No. 14,935
Int. Cl.[3] B65H *29/26*
U.S. Cl. 414—77 1 Claim



1. Apparatus for receiving and stacking elongated pieces of material successively longitudinally delivered in measured cut lengths from the output end of a cutting mechanism comprising:

a. An elongate main frame structure having a receiving end adapted to be coupled with the output end of the cutting mechanism;

b. a pair of elongate movably mounted belts extending lengthwise of said frame structure, said belts having confronting surface faces coacting to form a trough with one end positioned to receive each piece of cut material by an endwise movement from the output of said mechanism;

c. belt driving means for simultaneously moving the belt faces in a direction to carry the received pieces away from the outlet end of the mechanism;

d. means for separating the belt faces to bodily discharge a received piece by gravity from the trough into a receiver; and

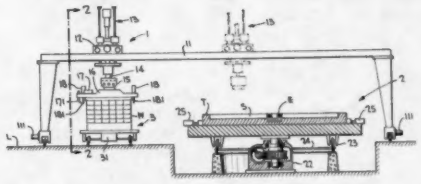
e. a rotatable bevelled idler wheel positioned at the input end of the trough and frictionally driven from one of said belts for coaction with the other of said belts to initially grip the received pieces.

4,256,428

APPARATUS FOR AUTOMATICALLY FITTING RUNNER BRICKS

Shoji Kitayama; Hiroaki Okamitsu; Motohiko Nakatani, and Toshiroh Shibata, all of Kitakyushu, Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed Jan. 31, 1979, Ser. No. 8,179
Claims priority, application Japan, Feb. 1, 1978, 53-11223
Int. Cl.[3] B65G *59/04;* B22D *7/00*
U.S. Cl. 414—121 10 Claims



1. An apparatus for automatically fitting runner bricks in slots in an ingot-making plate and having a brick conveying apparatus, comprising:

a movable gate-shaped girder;

a lifting device moved by a traversing device mounted on said girder;

a rotating device provided at the lower end of said lifting device and rotatable in a horizontal plane;

a sliding device slidable in a horizontal direction at the lower end of said rotating device;

a gripping device including a vacuum-sucking device at the lower end of said sliding device;

a rotating apparatus for rotating a horizontal ingot-making surface plate within a range in which said traversing device can move;

a movable work carriage including a running track and loaded with bricks; and

a carriage position detecting apparatus adapted to be fixed on the work carriage running track.

4,256,429

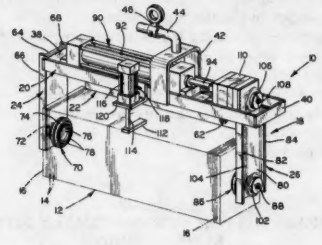
APPARATUS FOR HANDLING SIGNATURE BUNDLES

Robert E. Dwyer, Madison Heights, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Filed May 9, 1979, Ser. No. 37,460
Int. Cl.[3] B65G *7/00;* B66C *1/44*
U.S. Cl. 414—626 3 Claims

3. Apparatus for handling signature bundles comprising a U-shaped frame including a first leg, a second leg, and horizontal frame member means affixed to an end of said first leg and to an end of said second leg, a fluid-operated cylinder carried by said frame, a first clamping pad rotatably carried by said

first leg and facing toward said second leg, a second clamping pad rotatably carried by said second leg and facing toward said first clamping pad, said first clamping pad being movable toward and away from said second clamping pad by said fluid-operated cylinder, moving means carried by said frame for turning one of said first and second pads, locating means, and power driven moving means connecting said locating means



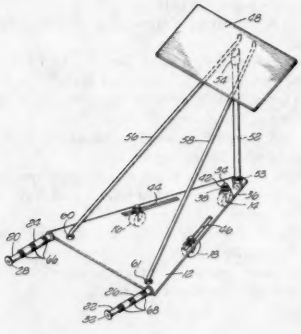
and said horizontal frame member means to position said locating means in a locating position at a predetermined distance from said horizontal frame member means to aid in locating a signature bundle relative to said frame and for moving said locating means from a retracted position to the locating position and from the locating position to the retracted position to enable a signature bundle carried by said apparatus to be rotated.

4,256,430

WHEEL CHANGE MECHANISM

Joseph P. Pugel, 937 S. 2nd St., Calimesa, Calif. 92320

Filed Jul. 16, 1979, Ser. No. 57,564
Int. Cl.³ B60B *29/00*
U.S. Cl. 414—428 **3 Claims**



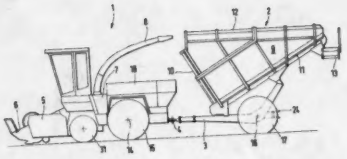
1. A wheel change mechanism comprising:
a base member movable along a support surface;
wheel support members extending from one end of said base member; and
a seat supported at the opposite end of said base member for pivoting said base member when force is exerted thereon; and
casters movable along the base for adjusting and defining the pivot plane of said base member.

4,256,431

SELF-DRIVEN FORAGE HARVESTER

Werner Strauss, Kehl, and Xaver Lenzer, Kleinkötz, both of Fed. Rep. of Germany, assignors to Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co., Gunzburg, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 26,214
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812430
Int. Cl.³ B60P *1/38*
U.S. Cl. 414—505 **4 Claims**



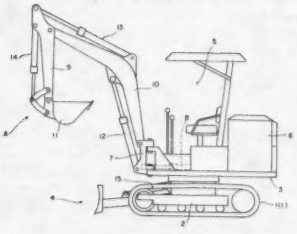
1. A self-driven forage harvester comprising: a main vehicle; a trailer operatively joined to said main vehicle; a first hydraulic drive axle including a first pair of drive wheels on said main vehicle; steering wheels for said main vehicle located forwardly of said first pair of drive wheels; a hydrostatic driving unit on said main vehicle arranged in the general vicinity of said drive axle; a second hydraulic drive axle on said trailer including a second pair of drive wheels for said trailer; and an upwardly inclined scraper floor formed in said trailer extending continuously from a lower forward end to an upper discharge end thereof; said second hydraulic drive axle of said trailer being located to extend beneath said scraper floor along a portion thereof intermediate said lower forward end and the midpoint of said scraper floor.

4,256,432

CONSTRUCTION OF CIRCUIT FOR WORKING VEHICLE OPERABLE AS BACKHOE AND ALSO AS DOZER

Shiro Sugiyama, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Aug. 22, 1978, Ser. No. 935,832
Claims priority, application Japan, Oct. 31, 1977, 52-146956
Int. Cl.³ E02F *3/32*
U.S. Cl. 414—694 **2 Claims**



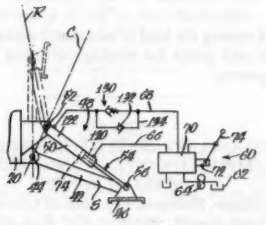
1. A hydraulic circuit construction for a working vehicle equipped with a backhoe means comprising a dozer means and right and left running means, a first hydraulic motor for one of the running means and a dozer hydraulic cylinder for the dozer means being coupled to be operated by a first hydraulic pump, a second hydraulic motor for the other running means and an arm hydraulic cylinder for an arm of a backhoe means are coupled to be operated by a second hydraulic pump, the arm cylinder being coupled to receive pressure fluid from the first and second pumps at the same time, a second multiplex valve assembly including a second motor control valve for the sec-

ond motor and an arm control valve for the arm cylinder being connected in parallel with each other to the second pump, a first multiplex valve assembly including a dozer control valve for the dozer cylinder, a first motor control valve for the first motor and an arm confluence control valve for supplying pressure fluid from the first pump to the arm cylinder, wherein said dozer valve, said first motor valve and said arm confluence valve are connected in series with one another to the first pump with the arm confluence valve being positioned downstream from the dozer and the first motor valves and a changeover valve for interrupting supply of pressure fluid to the arm confluence valve is provided downstream from the dozer and first motor valves and upstream from the confluence valve in multiplex valve arrangement in combination with the dozer, first motor and arm confluence valves.

4,256,433
HYDRAULIC CIRCUIT FOR EARTHWORKING IMPLEMENT

Donald R. King, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 9, 1979, Ser. No. 28,352
Int. Cl.³ B66C 23/66
U.S. Cl. 414—694 **13 Claims**



1. In an earthworking implement having a fixed frame and an elongated member pivoted on said frame by a fluid ram having a first pivotal connection on said frame and a second pivotal connection on said elongated member, said elongated member having a transport position defined between said frame and said first pivotal connection and a working position extending away from said frame, and a hydraulic circuit for supplying fluid to said rams, said hydraulic circuit including a reservoir, pump means for supplying pressurized fluid from said reservoir, conduit means connecting said reservoir and pump means to opposite ends of said fluid ram with valve means in said conduit means, and connection means for connecting both ends of said fluid ram to said reservoir when an elongated axis of said elongated member is coincident with said first pivotal connection as said member is being moved from said working position to said transport position.

4,256,434
METHOD OF LOADING BALES ON TO TRANSPORT VEHICLES

Eberhard Stodt, Düsseldorf, and Erwin Kaldenbach, Ratingen, both of Fed. Rep. of Germany, assignors to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,841
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753720
Int. Cl.³ B65G 67/04
U.S. Cl. 414—786 **6 Claims**

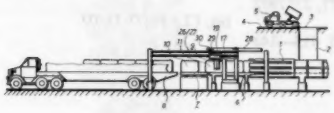
1. A method of loading on to a transport vehicle bales of waste material which are ejected successively from a horizontally acting baling press, said method comprising the steps of:

(a) positioning the transport vehicle, which has a load deck, with the vertical longitudinal central plane of said deck substantially in alignment with the vertical central plane of a discharge opening of said baling press; ejecting a row of bales in succession from said discharge opening; causing a first bale of said row of bales to reach a preliminary position; conveying said first bale from said row individually from said preliminary position in the direction in which said bales are ejected from said discharge opening;

(b) moving said first bale further in said direction to a first predetermined limiting position;

(c) moving said first bale perpendicularly to said direction horizontally through a distance exceeding the width of said bale;

(d) causing the succeeding bale in said row to reach said preliminary position; separating said succeeding bale from said row when said bale has reached a preliminary position, said succeeding bale being moved in said direction to said first predetermined position;



(e) moving said first bale and said succeeding bale together back perpendicularly to said direction into a position symmetrical with respect to said vertical longitudinal central plane whereby a gap previously existing between adjacent sides of said first bale and said succeeding bale is eliminated;

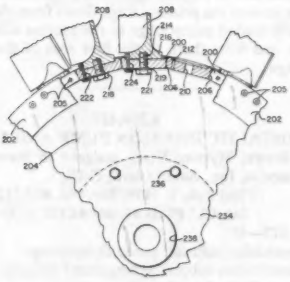
(f) moving said first bale and said succeeding bale forwards together in said direction on to said transport vehicle, said first bale and said succeeding bale both moving through a distance exceeding the length of one of said bales in said movement on to said vehicle; and

(g) repeating the foregoing sequence of steps with further pairs of bales, each pair comprising a first bale and a succeeding bale, until said vehicle is fully loaded.

4,256,435
MOUNTING SUPPORT BLOCKS FOR PIVOTAL ROTOR OF WIND TURBINE

Oliver C. Eckel, 147 Hickory Rd., Weston, Mass. 02193

Filed Aug. 2, 1978, Ser. No. 930,207
Int. Cl.³ F03D 7/02
U.S. Cl. 415—2 R **13 Claims**



1. A rotor blade assembly comprising:

(1) a plurality of support blocks each extending between and terminating adjacent to two rings, and means for releasably securing each of said support blocks individually to said rings so that said support blocks are captivated between said rings and form a cylindrical array, each support block having a recess;

(2) a plurality of rotor blades each attached to and extending radially outward from one of said support blocks, each of said blades comprising a fin and a mounting shoulder at

the bottom of each fin, each of said mounting shoulders being disposed in one of said recesses; and

(3) means for securely attaching said array of support blocks to a shaft that is coaxial with said array so that wind striking said rotor blades will cause said blades and said array of support blocks to rotate and impart rotation to said shaft.

4,256,436

SELF-PRIMING PUMP

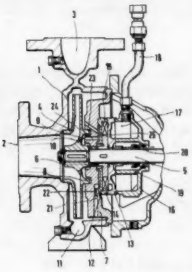
Peter Fandrey, Glückstad, and Hermann Müller, Oldendorf, both of Fed. Rep. of Germany, assignors to SIHI GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,357

Claims priority, application German Democratic Rep., Dec. 24, 1977, 2757952

Int. Cl.³ F01D *13/02*

U.S. Cl. 415—143 **8 Claims**



1. A self-priming centrifugal pump comprising at least one fully loaded pump stage mounted on a shaft, a priming stage mounted rigidly on the same shaft in the manner of a side channel or liquid ring pump, the suction side of the priming stage being connected through a first, permanently open port with a first, suction side area of the fully loaded pump stage in which gas that is to be drawn off collects, the suction side of the priming stage being connected through a second, permanently open port with a second area of the fully loaded pump stage which, during normal operation, is at a higher pressure than the first area, whereby both the first and second ports are so designed that in normal operation a stream of liquid that is sufficient to cool the priming stage flows from the second area of the fully loaded pump stage to the suction side of the priming stage and from there to the first area of the fully loaded pump stage.

4,256,437

PERISTALTIC INFUSION PUMP AND METHOD

Fon R. Brown, Hyrum, Utah, assignor to Stewart Naumann Laboratories, Inc., Santa Clara, Calif.

Filed Feb. 1, 1978, Ser. No. 874,212

Int. Cl.³ F04B *49/06;* **A61M** *5/00*

U.S. Cl. 417—45 **7 Claims**

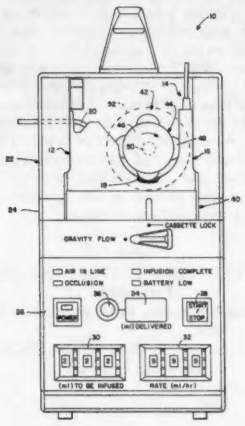
1. A peristaltic infusion pump comprising:

(a) a continuous tubular arrangement adapted to pass intravenous fluids therethrough;

(b) means for supporting a predetermined tubular section of said arrangement in an exposed and readily accessible position;

(c) a peristaltic pump head mounted for rotation about a fixed axis, said pump head including a plurality of interconnected, circumferentially spaced tube engaging members adapted to successively engage said predetermined tubular section during rotation of said pump head for peristaltically pumping fluid through said tubular arrangement; and

(d) means for rotating said pump head in incremental steps about said axis, said rotating means including electromagnetic stepping motor means; and



(e) means sensing the load of said motor means during operation of said pump for sensing occlusion in said tubular arrangement.

4,256,438

METHOD AND APPARATUS FOR SIMULTANEOUS NOISE DAMPING ON INTAKE AND PRESSURE SIDES OF FLUID PUMPS

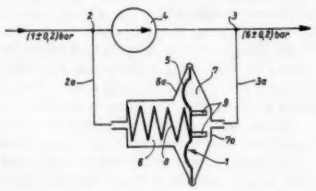
Rainer Schillinger, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 4, 1979, Ser. No. 36,105

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823768

Int. Cl.³ F04B *11/00*

U.S. Cl. 417—53 **4 Claims**



1. A method for the simultaneous damping of noise in fluid pumps, such as fuel supply pumps, including a housing having a tapered shaped chamber converging toward a rim area of a diaphragm, an electromotor and a plurality of driven pumping stages disposed within said housing comprising the steps of:

diverting the peaks of variation in the supply medium on the intake and pressure sides of said diaphragm in said housing of the fluid pump,

bringing said peaks of variation in the supply medium together into an effective contact in a common region separated by said diaphragm whereby the peaks of variation are adjusted in such a manner that a phase displacement of 180° is produced in the variations for the purpose of mutual compensation of the pressure variations on both intake and pressure sides which cause the generation of noise,

performing an initial stressing in order to balance out the different average values of the two pressure variations in the common contact region, and

varying the length of the variation peaks in order to attain a mutual phase displacement of 180° in the common contact region.

2. An apparatus for the simultaneous damping of noise on the intake and pressure sides of fluid pumps such as fuel supply pumps including a housing, an electromotor and a plurality of rotary driven pumping stages disposed within said housing comprising, in combination:

a housing having a separation diaphragm therein and having walls forming a tapered-shaped chamber converging toward a rim area of the diaphragm, said diaphragm being disposed within said housing to form a compensation apparatus, and

being disposed in a separation plane between the intake side and the pressure side of said fluid pump, said diaphragm being arranged in mutual operational contact at least with the variation peaks diverted from said intake side and the pressure side,

connection lines for communicating said housing with the intake side and the pressure side of said fluid pump, said connection lines having dimensions such that, at least one of the length, thickness and guidance of the variation peaks is accordingly dimensioned whereby the variation peaks from the intake and the pressure sides exhibit a phase displacement of 180° at said diaphragm.

4,256,439

POWER CONTROL SYSTEM FOR MULTIPLE PUMPS

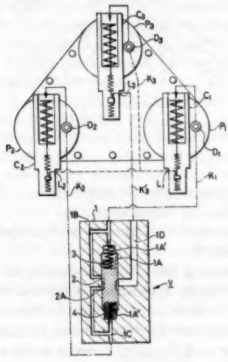
Hiroshi Kosodo; Heiji Tomotsugu, and Hiroshi Kudo, all of Yokohama, Japan, assignors to The Japan Steel Works Ltd., Tokyo, Japan

Filed Sep. 19, 1979, Ser. No. 76,909

Claims priority, application Japan, Nov. 20, 1978, 53/143614

Int. Cl.³ F04B *49/08*

U.S. Cl. 417—216 **11 Claims**



1. A power control system for multiple pumps including more than two variable volume pumps, at least two of the pumps having the same capacity, all of the pumps being driven by a single engine, the control system comprising a pressure selector valve which is fed with pressure from two of the pumps having the same capacity, the lower pressure selectively picked up by the selector valve being fed to a pilot portion of a tilt control on at least one of the other variable volume pumps and, at the same time, the output pressure of the other pumps being fed to a pilot portion of a tilt control on at least one of said two variable volume pumps having the same capacity.

4,256,440

LIQUID DOSING APPARATUS

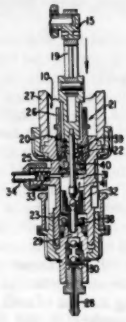
Johann Kern, Vachendorf, and Walter Eichner, Siegsdorf, both of Fed. Rep. of Germany, assignors to Lang Apparatebau GmbH, Siegsdorf Obb., Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 55,953

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831625

Int. Cl.³ F04B *23/06, 19/00*

U.S. Cl. 417—391 **6 Claims**



1. An apparatus for dosing a solution into a liquid conduit by means of a piston dosing pump mechanically driven by the liquid pressure, which comprises a dosing pump having a chamber containing liquid from the conduit and into which the solution is delivered from a supply source, a spring-biased nonreturn valve between the dosing pump chamber and the liquid conduit, and a second pump which supplies fresh liquid to the dosing pump chamber, the piston of the second pump being synchronized with the piston of the dosing pump.

4,256,441

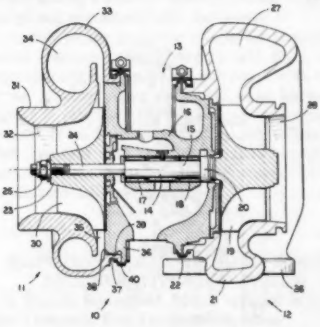
FLOATING RING BEARING STRUCTURE AND TURBOCHARGER EMPLOYING SAME

Gulshan K. Arora, Indianapolis, Ind., assignor to Wallace-Murray Corporation, Indianapolis, Ind.

Filed Jun. 19, 1979, Ser. No. 50,102

Int. Cl.³ F04B *35/00*

U.S. Cl. 417—407 **15 Claims**



1. A bearing structure for a rotatable shaft subjected to axial thrust loads which comprises:

a bearing housing defining a cylindrical bore;

a thrust sleeve received within the cylindrical bore of said bearing housing and having first and second end bearing surfaces, said thrust sleeve having an outer diameter

smaller than the diameter of the cylindrical bore in said bearing housing;

a first bearing sleeve received within the bore of said bearing housing and having a first end bearing surface positioned adjacent the first end bearing surface of said thrust sleeve, said first bearing sleeve further having a second end bearing surface;

a second bearing sleeve received within the bore of said housing and having a first end bearing surface positioned adjacent the second end bearing surface of said thrust sleeve, said second bearing sleeve further having a second end bearing surface;

a shaft rotatably received within said thrust sleeve and said first and second bearing sleeves, said shaft having a diameter smaller than the inside diameter of said thrust sleeve;

first thrust-transmitting means associated with said shaft for transmitting axial thrust from said shaft to the second end bearing surface of said first bearing sleeve;

second thrust-transmitting means associated with said shaft for transmitting axial thrust from said shaft to the second end bearing surface of said second bearing sleeve; and

retaining means for retaining said thrust sleeve within said housing to limit rotation and to limit axial displacement of said thrust sleeve, said retaining means further being for permitting movement of said thrust sleeve within said bearing housing to provide substantial parallel alignment of the first end bearing surface of said thrust sleeve with the first end bearing surface of said first bearing sleeve upon transmission of axial thrust from said first bearing sleeve to said thrust sleeve and in response to different orientations of said first bearing sleeve, said retaining means further being for permitting movement of said thrust sleeve within said bearing housing to provide substantial parallel alignment of the second end bearing surface of said thrust sleeve with the first end bearing surface of said second bearing sleeve upon transmission of axial thrust from said second bearing sleeve to said thrust sleeve and in response to different orientations of said second bearing sleeve.

4,256,442

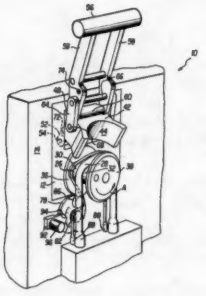
IMPROVED PRESSURE PLATE MOVEMENT SYSTEM FOR A PERISTALTIC PUMP

Rene G. Lamadrid, Bethesda, and Herbert M. Cullis, Silver Spring, Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 18, 1979, Ser. No. 31,140

Int. Cl.³ F04B *45/06*

U.S. Cl. 417—477 **31 Claims**



1. A peristaltic pump comprising:

a pump base;

at least one pump tube through which a fluid is to be pumped;

pump roller means rotatably mounted upon said pump base and operatively engaged with said at least one pump tube for pumping said fluid through said at least one pump tube;

pressure plate means for defining a pumping chamber with said pump roller means, said pressure plate means being pivotably mounted upon said pump base for movement between a closed position whereby said pressure plate means operatively cooperates with said pump roller means for pumping said fluid through said at least one pump tube, and an open position whereby said pressure plate means is operatively disengaged from said pump roller means so as to render said pumping chamber accessible and thereby facilitate the loading and unloading of said at least one pump tube into and out of said pumping chamber;

handle means permanently mounted in a pivotable mode upon said pump base for actuating said pressure plate means to either one of said open or closed positions; and

a four-bar linkage system interconnecting said handle means and said pressure plate means.

4,256,443

ROTARY VANE-TYPE ENGINE THROTTLE CHANNELS COMMUNICATING BETWEEN ADJACENT WORKING SPACES

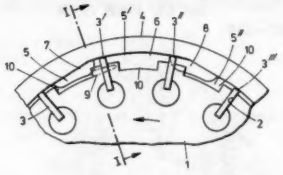
Lothar Kunze, Hofheim-Langenhain, and Manfred Kahrs, Wiesbaden, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 20, 1979, Ser. No. 31,907

Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822102

Int. Cl.³ F01C *21/00*; F03C *2/00*; F04C *15/00*

U.S. Cl. 418—77 **10 Claims**



1. A rotary vane-type engine, comprising:

a rotatable rotor having radial slots;

working vanes disposed in said slots and guided for radial displacement therein;

a cam ring surrounding the rotor and having an inner contour surface, whereby a chamber is formed between the cam ring inner contour surface and the rotor, said vanes having radially outwardly directed end surfaces for abutting engagement with the inner contour surface of the cam ring for subdividing the chamber into working spaces;

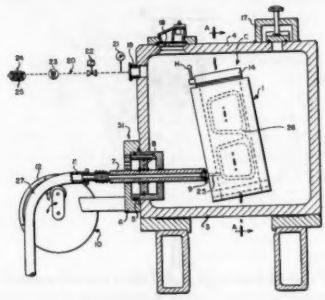
side plates for abutting against the front surfaces of said rotor and cam ring and including control ports for the supply and discharge of a fluid;

throttle channels associated with selected control ports and formed at the end thereof and extending in the rotor circumferential direction for permitting communication between adjacent working spaces when said working spaces are in communication with a throttle channel; and means associated with said rotor for effecting said communication and whereby the effective length to diameter ratio of the throttle channels is reduced as the rotor rotates and causes said working spaces to approach one of said selected control ports.

4,256,444
PLANT FOR INJECTION MOLDING OF THERMOSETTING EPOXY PLASTICS

Alois Suter, Im Holeeletten 29, 4054 Basel, Switzerland, assignor to Alois Suter, Basel, Switzerland

Continuation-in-part of Ser. No. 722,918, Sep. 13, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,443
Int. Cl.³ G29G *3/00*
U.S. Cl. 425—73 8 Claims



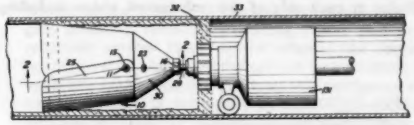
1. Apparatus for the vacuum molding of epoxy resin molding compositions comprising:
- at least two premixing tanks each having inlet means for the admission of selected constituents of the molding composition and means for mixing said constituents therein;
- means for producing vacuum pressure conditions in each of said tanks;
- a mixing tube for blending the degassed compositions from said tanks to form a liquid-pasty molding composition;
- means associated with said mixing tube for heating the material being mixed therein;
- conduit means connecting each of said tanks with said mixing tube;
- means for conveying under pressure through said conduit means the degassed constituent compositions from said tanks to and through said mixing tube;
- a mold having inlet means for the admission of molding composition thereinto;
- means for selectively producing and maintaining vacuum pressure in said mold;
- a valve member having a discharge orifice alignable with the inlet means of said mold, said valve member and orifice being selectively movable relative to said mold;
- means for conveying molding composition from said mixing tube to said valve member;
- and means for selectively driving said valve member and said orifice into engagement with said mold and for maintaining engagement of said orifice and mold inlet means at a pressure greater than the pressure at which said molding composition is conveyed through said mixing tube.

4,256,445
TROWEL MEANS FOR LINING AND SMOOTHING THE INTERIOR OF PIPES WITH A PROTECTIVE COATING

Robert J. Pingree, 270 NE. 21st St., Boca Raton, Fla. 33432

Filed Oct. 12, 1978, Ser. No. 950,661
Int. Cl.³ B28B *21/18*
U.S. Cl. 425—101 14 Claims

1. A trowel apparatus for smoothing a layer of mortar or plastic lining material in the interior of a generally cylindrical pipe or tubing comprising; means to form a resiliently expansible frusto-conical trowel body, having a relatively small leading end and a trailing end of larger size including a plurality of longitudinally extending overlapping plate members, each plate member being curved about the longitudinal axis of the apparatus and having one end of each plate member mounted to means for retaining a relatively fixed diameter of said plate members at the said small leading end of the troweling apparatus, wherein said means for mounting the said plate members to retain a relatively fixed diameter include an inner frame which

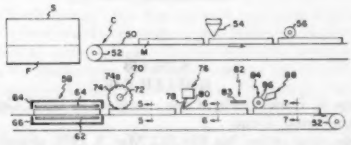


is generally conical and coaxial with said frusto-conical body and includes a main rim and at least three support arms which taper down to a small rim and a hexagon shaped nut, which are welded together to form a substantially single inner frame member.

4,256,446
APPARATUS FOR MANUFACTURING PREFINISHED WALLBOARD

Servando G. Hinojosa, 1127 Lillian, Alice, Tex. 78332, and Octavio G. Hinojosa, Alice, Tex., assignors to Servando Hinojosa, Alice, Tex.

Division of Ser. No. 450,281, Mar. 12, 1974, which is a division of Ser. No. 237,345, Mar. 23, 1972, Pat. No. 3,798,854. This application Feb. 9, 1979, Ser. No. 10,627
Int. Cl.³ B29D */23/05*
U.S. Cl. 425—115 8 Claims



1. Apparatus for forming plural substantially identical wall boards from preformed wall panels comprising:
- means for placing, over one side of each said wall panel, a layer of moldable, settable material which, when cured, will be harder than said wall panel;
- rotatable drum means for creating a plurality of recesses in each layer of moldable material to provide a pattern therein having a contour which does not follow the contour of said one side of said wall panel;
- said creating means including means for forming first and second relieved portions in each said layer, along both major side edges of each said wall panel, with the first and second portions along each said edge having different degrees of relief and the relief along transversely aligned portions of each said wall board are different, so that when one said wall board is installed laterally adjacent another said wallboard adjacent portions of the two wall boards have different reliefs.

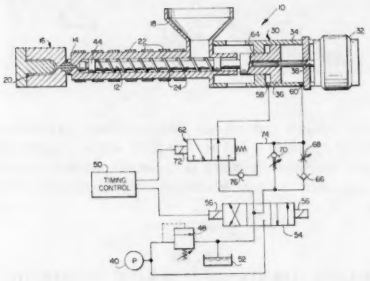
4,256,447
INJECTION MOLDING MACHINE WITH REGENERATIVE FEED SYSTEM

Robert E. Farrell, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Oct. 2, 1978, Ser. No. 948,082
Int. Cl.³ B29F *1/04, 1/06*
U.S. Cl. 425—159 7 Claims

1. In an injection molding machine having a mold defining a mold cavity charged with a settable material by means of a movable ram, the improvement comprising: actuating means for stroking the ram including a piston and cylinder assembly

connected with the ram and having an unbalanced piston movable in the assembly by means of pressurized fluid in the cylinder, a first side of the unbalanced piston having a smaller effective pressure area than the opposite, second side; and fluid control means for directing pressurized fluid in and out of the cylinder at each side of the unbalanced piston including a



regeneration valve having fluid connections with the cylinder at the first and second sides of the piston and operable between a first condition effectively interrupting fluid communication between the two sides of the piston and a second condition permitting fluid communication between the two sides for selectively operating the unbalanced piston regeneratively.

4,256,448

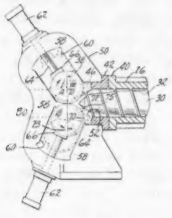
ROLLER DIE

George E. Carle, Derby, Conn., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 884,742, Mar. 9, 1978, abandoned. This application Aug. 13, 1979, Ser. No. 66,020

Int. Cl.³ B29F *3/012*

U.S. Cl. 425—367 **4 Claims**



1. A roller die arrangement for an extrusion machine having an extrusion screw therein, said roller die arrangement comprising:

a pair of cooperating rolls which between them define a nip for receiving and processing any material passed therebetween; and

a support means mounted on the outlet of said extrusion machine for supporting said cooperating rolls, said support means including adjustment means to permit transverse movement of said cooperating rolls with respect to one another in said support means, said transverse movement of said cooperating rolls also being oblique to the direction of material being extruded from said extrusion screw to change the characteristics of said nip therebetween.

4,256,449

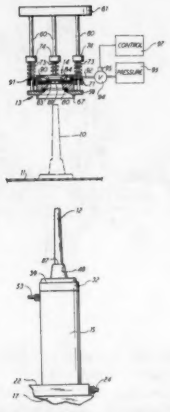
DRAW-FORMING OF STRETCHABLE THERMOPLASTIC MATERIAL INTO HOLLOW ARTICLES

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Filed Jul. 30, 1979, Ser. No. 62,172

Int. Cl.³ B29C *17/04*

U.S. Cl. 425—388 **20 Claims**



1. Apparatus for forming mechanically and pneumatically a thin walled hollow article from a stretchable thermoplastic sheeting member comprising:

(A) a die set comprising a male forming die means and a cooperating female forming die means, said male die means and said female die means being relatively reciprocating along an axis,

(B) said female die means including a draw ring means and an opening defined through said female die means and drawn ring means,

(C) sheeting positioning means disposed adjacent said opening at one side of said female die means for positioning said sheeting means across said opening between said male die means and said female die means when said die means and said female die means are in a relatively disengaged relationship,

(D) said male die means including an elongated mandrel means which is adapted to register with and project through said opening and thus through said female die means and draw ring means,

(E) a housing means disposed in axially spaced adjacent relationship to said female die means on that side thereof opposed to the side thereof which is adjacent said sheeting positioning means, said housing means having an aperture defined therethrough, said mandrel means being adapted to project through said aperture and thus through said housing and said housing means including a gas conducting passageway means defined therein terminating in a circumferentially extending, generally radially inwardly directed nozzle means on said aperture for directing an axially localized gas stream against said sheeting over said male die means in an article forming operation, said aperture being in radially spaced relationship to said sheeting,

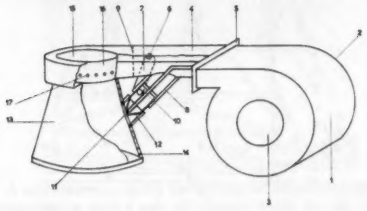
(F) said mandrel means including a first conduit means defined therein for circulating a thermally conditioning fluid therethrough and also second conduit means for establishing a negative pressure within an article being formed over said mandrel means during an article forming operation for conforming said article over adjacent surface portions of said mandrel means.

4,256,450

LIQUID FUEL BURNER

Raymond Bourbon, Caluire, France, assignor to Centre Technique Industriel dit "Centre Technique des Industries Aerauliques et Thermiques", Orsay, France

Filed Nov. 21, 1978, Ser. No. 962,740
Claims priority, application France, Nov. 25, 1977, 77 36455
Int. Cl.[3] F23D *5/02*
U.S. Cl. 431—337 **8 Claims**



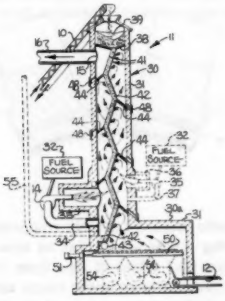
1. A burner for use with liquid fuel, said burner comprising in combination a combustion head, means including a pipe to feed combustion air under pressure to said combustion head, a vaporisation chamber connected to said combustion head to provide vaporised fuel to said combustion head, and means for feeding liquid fuel in the form of droplets to said vaporisation chamber, said fuel feeding means including a converging tube terminating in a wall of said vaporisation chamber, means for feeding liquid fuel at essentially atmospheric pressure to said tube and means for feeding a vortical stream of air for atomisation to the level of the neck of said converging tube.

4,256,451

UPRIGHT KILN AND ATTENDANT METHOD FOR HEATING AN AGGREGATE MATERIAL

Allen S. Johnson, Jr., P.O. Drawer 1037, Salisbury, N.C. 28144

Continuation-in-part of Ser. No. 88,522, Oct. 26, 1979, Continuation-in-part of Ser. No. 95,446, Nov. 19, 1979. This application Feb. 15, 1980, Ser. No. 121,893
Int. Cl.[3] F27B *15/00;* **F27D** *1/08*
U.S. Cl. 432—14 **15 Claims**



1. An upright kiln for heating a solid aggregate and comprising

an upright hollow housing having an air inlet opening in a lower portion thereof and an air outlet opening in an upper portion thereof,

means communicatively connected to said housing for causing outside air to flow upwardly through said housing, entering the housing through said air inlet opening and leaving the housing through said air outlet opening,

a fuel burner provided in aid housing and operable for combusting a fuel for heating the air flowing within said housing,

a pair of opposing gas permeable retaining walls of nonlinear zigzag configuration positioned within said upright housing and extending generally longitudinally thereof in closely spaced relation to one another to define an elongate generally vertically extending zigzag passageway relatively narrow cross section adapted for receiving aggregate at the upper end thereof and for maintaining the aggregate in the form of a relatively thin continuous layer extending generally vertically in a series of oppositely directed downwardly inclined courses of travel, each of said opposing gas permeable retaining walls being comprised of a series of laterally extending spaced apart slats interconnected to define inclined segmental wall portions inclined at an angle within the range of about 10° to about 25° from the vertical axis and so arranged that alternate segmental wall portions are inclined to one side of the vertical axis, with the intervening segmental wall portions being inclined to the opposite side of the vertical axis and with the slats of the opposing series being convergingly arranged and inclined angularly downwardly in the direction of movement of the aggregate and positioned in overlapping relation to one another to assist in guiding the aggregate along its downward path of travel while confining the aggregate within the passageway and while also readily permitting the flow of heated gas into and through the thin layer of aggregate,

means cooperating with said pair of retaining walls and with the surrounding housing for directing the flow of heated air within said housing successively through each of said oppositely directed downwardly inclined courses of travel of the layer of aggregate so as to flow laterally back and forth through the thin layer of aggregate from opposite sides thereof to provide highly effective contact of the heated air with the aggregate for heating of the aggregate,

means for discharging aggregate from the lower end of said passageway to thus cause the layer of aggregate to move downwardly along said passageway, and

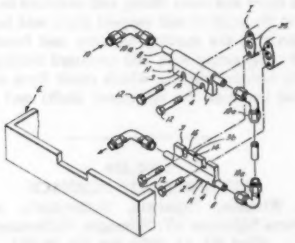
means for supplying aggregate to the upper end of said passageway to thus maintain the passageway filled with aggregate.

4,256,452

CONDUCTION HEATING ASSEMBLY

David C. Goss, and Richard A. Hageman, both of San Marcos, Tex., assignors to Thermon Manufacturing Company, San Marcos, Tex.

Division of Ser. No. 921,265, Jul. 3, 1978, Pat. No. 4,213,034. This application Jan. 21, 1980, Ser. No. 113,485
Int. Cl.[3] F28F *7/00;* **F24J** *3/00*
U.S. Cl. 432—225 **2 Claims**



1. A heating assembly for use in heating an instrument, comprising:

a heat transfer unit adapted to be mounted to the exterior of the instrument to be heated, said heat transfer unit including a heat transfer means and a heating means;

said heat transfer means having a first surface and a heat

transfer surface substantially perpendicular and adjacent to said first surface;

said heat transfer surface for engaging an external surface of the instrument;

said heat transfer means having an opening formed therethrough extending substantially perpendicularly through said heat transfer surface, said opening also formed in proximity said first surface to receive a mounting means therethrough;

said mounting means extending through said heat transfer surface, said mounting means substantially perpendicular to said heat transfer surface for securing of said heating element to the instrument;

said heating means formed with said heat transfer means, said heating means having a tubular passage with the axis thereof substantially parallel to said first surface at the midpoint thereof and substantially parallel to the plane of said heat transfer surface for the passage of fluid therethrough; and

said opening disposed between said first surface and said heating means.

4,256,453

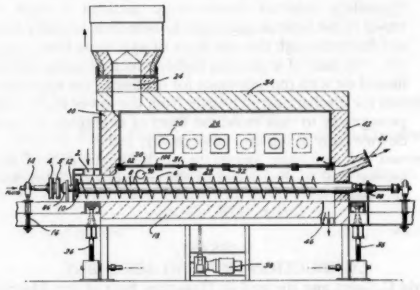
CALCINER SCREW CONSTRUCTION

Michael A. Csapo, Wyncote, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Oct. 16, 1978, Ser. No. 951,384

Int. Cl.³ F27D *3/00*

U.S. Cl. 432—235 **21 Claims**



6. In a calciner of the type wherein a screw type conveyor is provided to advance material to and through a calcining chamber, said calciner including a screw conveyor comprising an outer screw flight shaft and an inner, internally cooled support shaft mounted within said outer shaft, the improvement comprising a plurality of bearing members extending between the respective outer and inner shafts, and outboard bearing means mounted at the ends of said support shaft, said bearing members maintaining the spacing between said inner and outer shafts and cooperating with said outboard bearing means for minimizing bending stresses which result from temperatures differentials between the respective shafts and along their lengths.

4,256,454

LIFTING PLATE FURNACE

Tjeerd G. Wiersma, Nijmegan, Netherlands, assignor to Smit Ovens Nijmegen BV, Nijmegan, Netherlands

Filed Jul. 12, 1979, Ser. No. 56,942

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831251

Int. Cl.³ F27D *3/00, 3/12*

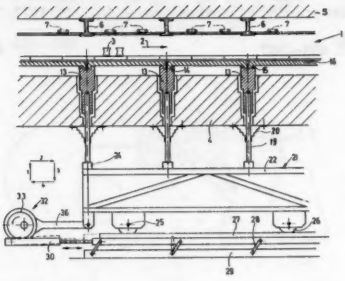
U.S. Cl. 432—241 **15 Claims**

1. A furnace comprising:

a furnace flue through which products to be fired are advanced between an inlet and an outlet;

at least one bearing plate for supporting said products in said flue;

means for supporting said plate on the bottom of said flue so that said bearing plate can be lifted, advanced and replaced;



a plurality of rams mounted below said plate at separated locations along the direction of advance for lifting, advancing and replacing said plate; and

means connected to said rams for operating said rams to lift, advance, and replace said plate.

4,256,455

ORTHODONTIC BRACKET AND ORTHODONTIC APPLIANCE

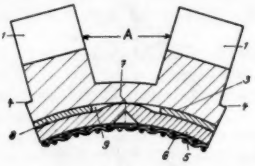
Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Bernhard Förster GmbH, Pforzheim, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 42,855

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2818665

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—8 **7 Claims**



1. An orthodontic bracket assembly comprising

a bracket having a base which has an upwardly exposed central portion and which is free from resistance spot-weldable projections at its lower edges, and two anchoring means which are spaced apart in the longitudinal direction of said base and rise therefrom on opposite sides of said central portion and define a longitudinal groove, and

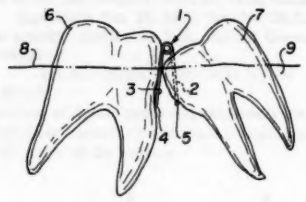
a mounting strap which is connected to the underside of said base by a soldered joint under said anchoring means,

said soldered joint having an aperature under said central portion and said mounting strap having an upwardly protruding arched portion which extends through said aperture and is joined to said central portion by a spot weld so as to reliably secure said mounting strap to said bracket.

4,256,456
TOOTH UPRIGHTING OR SEPARATING APPLIANCE

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Jun. 7, 1978, Ser. No. 913,296
Int. Cl.³ A61C 7/00
U.S. Cl. 433—21 47 Claims



1. A self-retaining tooth uprighting or separating appliance for cooperating with a pair of adjacent teeth having opposing and closely spaced side surfaces, comprising:

first means adapted to be interposed into a space between said pair of teeth for bearing against one of said opposing side surfaces of one of said pair of teeth;

second means adapted to be interposed into the space between said pair of teeth for bearing against said side surface of the other of said pair of teeth which is opposed to said side surface against which said first means bears;

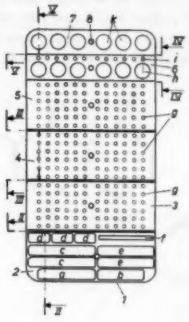
spring means interconnecting said first and second means and biassing said first and second means away from each other and toward said respective opposed side surfaces of said pair of teeth to separate said pair of teeth, said spring means also applying an uplifting force to at least one of said first and second means relative to the other of said first and second means, and said spring means having a dimension in the widthwise or buccal direction of a tooth which is not substantially greater than the width of a tooth, and said spring means having a further dimension in the lengthwise direction of a tooth which is not greater than the height of the crown of the tooth; and

cooperating engagement means on each of said first and second means for directly contacting said engaging said respective side surfaces of said adjacent teeth to prevent disengagement of said appliance from said adjacent teeth to prevent disengagement of said appliance from said adjacent teeth without requiring external anchoring devices, the appliance thereby being self-retaining relative to said adjacent teeth.

4,256,457
CONTAINER FOR DENTAL EQUIPMENT FOR ROOT-TREATMENT

Horst Behring, Struckholt 8B, 2000 Hamburg 63, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,496
Claims priority, application Switzerland, Sep. 27, 1978, 10059/78
Int. Cl.³ A61G 1/14
U.S. Cl. 433—77 6 Claims



1. A container for dental equipment for use in root-treatment and having a plurality of inserts located side-by-side and serving to receive the dental equipment, the inserts being constructed as minitrays which can be removed individually and sterilized with each being provided on its upper side with a handle and on its underside with legs, and there being at least three different forms of minitray, whereof the first comprises elongated recesses for locating instruments, the second comprises holes with diameters of the order of 1 to 2 mm for receiving instruments, and the third comprises holes with diameters of the order of 5 to 20 mm for receiving receptacles for holding treatment material and there being at least one of each form of minitray.

4,256,458

METHINE DYES FOR PAPER AND AMONICALLY-MODIFIED FIBERS

Hans-Juergen Degen, Lorsch; Franz Feichtmayr, Ludwigshafen, and Klaus Grychtol, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

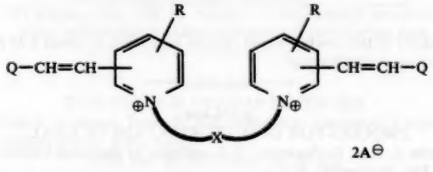
Division of Ser. No. 964,148, Nov. 28, 1978, abandoned. This application Jun. 21, 1979, Ser. No. 50,527

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754403

Int. Cl.[3] D21H *1/46;* C07D *213/04*

U.S. Cl. 8—506 2 Claims

1. A method of dyeing paper and anionically modified fibers which comprises contacting said paper or anionically modified fibers with a dye of the formula



wherein the groups Q are the same or different substituted or unsubstituted aryl or hetaryl radicals,

A is an organic or inorganic anion;

R is selected from the group consisting of hydrogen, methyl or ethyl;

X represents a bridge member selected from the group consisting of aliphatic, aromatic and heteroaromatic radicals, and wherein the methine groups are in the α- or γ-position.

4,256,459

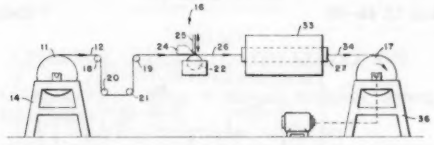
PROCESS FOR DYEING CLOSELY CONSTRUCTED NON-TUFTED TEXTILE MATERIALS AND PRODUCTS PRODUCED THEREBY

Edwin L. Russell, and Norvin A. Clontz, both of LaGrange, Ga., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 15, 1978, Ser. No. 915,819

Int. Cl.[3] D06P *5/00;* C09B *67/00*

U.S. Cl. 8—471 34 Claims



1. A process for improving the sharpness of a pattern of dyestuff applied to closely constructed non-tufted textile materials comprising:

(a) applying an effective minor amount of substantially oil and water repellant fluoropolymer to the textile material to provide a polymer modified textile material;

(b) heating the polymeric modified textile material at a temperature effective to cure said polymeric constituent; and

(c) applying dyestuff to the cured polymeric modified textile material in a pattern.

4,256,460

PROCESS FOR DYEING AND PRINTING CELLULOSE FIBRES

Günter Gehrke, Cologne; Werner Kühnel, Leverkusen, and Robert Kuth, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

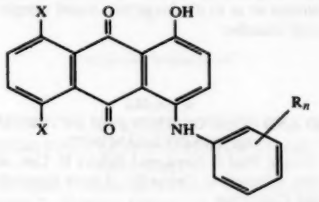
Filed Oct. 4, 1979, Ser. No. 81,991

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845322

Int. Cl.[3] D06P *3/82, 3/60*

U.S. Cl. 8—532 4 Claims

1. In the dyeing and printing of cellulose fibres alone or admixed with other fibers by swelling said fibres with a water-miscible swelling agent capable of maintaining the fibers in swollen condition after removal of water, boiling above 150° C. and, treating the swollen fibres with a dyestuff, and fixing the dyestuff by heat treatment, the improvement which comprises employing as said dyestuff a compound of the formula



wherein

R is optionally substituted C_1–C_6-alkyl, cyclohexyl, C_1–C_4-alkoxy, phenyl, benzyl, phenylethyl, phenylpropyl or phenoxy, or chlorine or bromine,

n is 0, 1 or 2,

one X is OH and

the other X is NO_2, NH_2 or R'-COHN, and

R' is optionally substituted C_1–C_4-alkyl or phenyl.

4,256,461

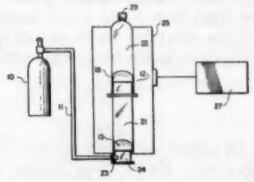
METHOD AND APPARATUS FOR EQUILIBRATING GAS AND LIQUID IN A TRANSPORTABLE VESSEL—SYRINGE TONOMETER

William D. Wallace, 1550 S. 1300 East, Salt Lake City, Utah 84105; Christopher A. Cutler, 649 E. 1130 North, Bountiful, Utah 84010; Justin S. Clark, 720 E. 3120 South, Salt Lake City, Utah 84106, and Frederick L. Farr, 2834 E. 2100 South, Salt Lake City, Utah 84109

Filed May 17, 1979, Ser. No. 39,776

Int. Cl.[3] G01N *33/96, 33/50*

U.S. Cl. 23—230 B 17 Claims



17. A method of equilibrating the partial pressures in a liquid sample with a gas of known composition such that the equilibrated liquid sample may be readily transported and discharged into an analyzing chamber without any substantial risk of deteriorating air contamination, the method comprising the steps of deteriorating air contamination, the method comprising the steps of:

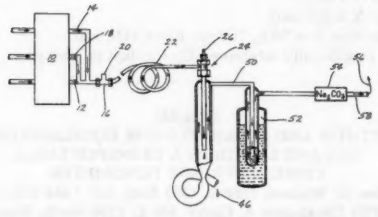
partially filling a first chamber formed inside the barrel of a syringe plunger with a humidifying liquid;
placing said liquid sample inside a second chamber formed inside the outer barrel of said syringe;
placing said syringe into a heat-conductive block such that the block will surround at least a portion of both of said chambers;
connecting said first chamber to a pressurized gas source;
heating said block so as to maintain the temperature of both the chambers at an essentially constant value;
bubbling said gas through said humidifying liquid and through said liquid sample so as to achieve equilibration of said liquid sample;
removing said syringe from the heat-conductive block;
pushing said syringe plunger further into the outer barrel of said syringe so as to eject the remaining gas from said second chamber and thereafter transporting the syringe to an analyzing chamber; and
further pushing said syringe plunger in said outer barrel of the syringe so as to discharge said liquid sample into said analyzer chamber.

4,256,462

METHOD AND COMPOSITION FOR DETERMINATION OF N-NITROSAMINES

Clyde W. Frank; Paul J. Nord, and Robert D. Cox, all of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 28, 1979, Ser. No. 108,236
Int. Cl.³ G01N *31/00, 33/00;* C01B *21/24*
U.S. Cl. 23—230 R **19 Claims**



1. A method of denitrosating N-nitrosamines, said method comprising: reacting an N-nitrosamine with a denitrosating agent which is a mixture of an acid component consisting essentially of glacial acetic acid and a concentrated inorganic acid, at a concentration of at least about 12 molar, selected from the group consisting of phosphoric acid and sulfuric acid, the volume ratio of glacial acetic to said concentrated inorganic acid being from 1:2 to 5:1, in combination with from about 0.1% to about 5% by weight of an inorganic water soluble bromide or iodide salt to form nitric oxide.

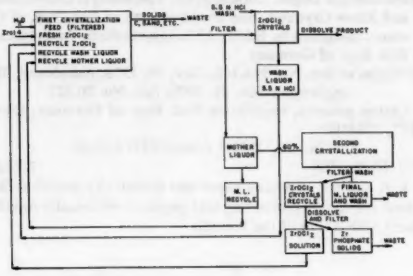
4,256,463

PREPARATION OF ZIRCONIUM OXYCHLORIDE

Dorothy P. Carter, Albany, Oreg., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 12, 1979, Ser. No. 19,326
Int. Cl.³ B01D *9/00;* C01F *7/34;* C01G *23/02*
U.S. Cl. 23—296 **4 Claims**

1. In a method of producing the oxychloride of a metal selected from the group consisting of zirconium and hafnium by dissolving zirconium tetrachloride or hafnium tetrachloride in water and mother liquor from a previous crystallization and subsequently crystallizing from the newly formed mother liquor, the improvement comprising producing said oxychloride relatively free from phosphorus by maintaining the total



acidity of the newly formed mother liquor below about 5.75 N during crystallization.

4,256,464

PROCESS FOR DESULFURIZATION OF COAL

Asim B. Ray, Bridgewater, N.J., assignor to Research-Cottrell, Inc., Somerville, N.J.

Filed Oct. 1, 1979, Ser. No. 80,677
Int. Cl.³ C10L *9/02;* C10B *57/08*
U.S. Cl. 44—1 SR **5 Claims**

1. A process for desulfurization of sulfur containing pulverized coal consisting essentially of the steps:
suspending powdered sulfur containing coal in a liquid organic reaction medium generally inert to and a solvent for NO_x, and while suspended, introducing NO and oxygen or an oxygen containing gas into the slurry;
washing the reacted coal with water and then with a dilute solution of H_2SO_4 or Na_2CO_3; and
thereafter drying the desulfurized coal.

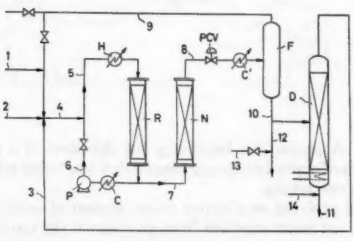
3. The process defined in claim 1 wherein the reaction medium comprises kerosine.

4,256,465

METHOD FOR PRODUCING METHYL TERT-BUTYL ETHER AND FUEL COMPOSITION CONTAINING THE SAME

Tetsuya Takezono, Kawasaki, and Yasuo Fujiwara, Tokyo, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Division of Ser. No. 853,192, Nov. 21, 1977, Pat. No. 4,182,913.
This application Jul. 20, 1979, Ser. No. 59,377
Claims priority, application Japan, Nov. 22, 1976, 51-140479; Nov. 22, 1976, 51-140480; Oct. 14, 1977, 52-123154
Int. Cl.³ C10L *1/02*
U.S. Cl. 44—56 **7 Claims**



1. A method for preparing a fuel composition for internal combustion engines comprising the steps of:
(A) allowing isobutylene and methyl alcohol to react with each other by continuously passing an isobutylene-con-

taining hydrocarbon mixture and methyl alcohol through a fixed bed filled with strongly acidic cation-exchange resin particles of 0.2 to 10 mm in mean grain diameter, at a temperature of 0° to 100° C., a pressure of 1 to 50 atmospheres and a liquid space velocity of 0.1 to 50 (1/hr), the molar ratio of isobutylene in said mixture to said methyl alcohol being in the range of 1:0.6 to 1:1.4;

(B) dividing the effluent from the reaction of step (A) into first and second parts in which the weight ratio of said first part to said second part is in the range from 1:3 to 1:15;

(C) recycling said second part to the fixed bed in step (A);

(D) passing said first part through a fixed bed filled with a water-insoluble, solid, particulate acid-neutralizing agent of 0.1 to 10 mm in mean grain diameter, at 0° to 100° C.;

(E) introducing the neutralized first part into a flashing tower to flash-remove unreacted hydrocarbon and to recover a methyl tert-butyl ether containing mixture from the bottom of said flashing tower; and,

(F) mixing 2 to 30% by volume of said methyl tert-butyl ether containing mixture with internal combustion fuel.

4,256,466

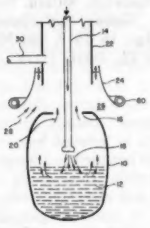
PROCESS FOR OFF-GAS RECOVERY

Frank C. Braemer, Teaneck, N.J., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jul. 16, 1979, Ser. No. 57,625

Int. Cl.³ C10K *3/00*

U.S. Cl. 48—197 R **17 Claims**



1. A process for increasing the fuel value of gases containing carbon monoxide emitted from a furnace and captured by a gas capture device, comprising:

a. forming a carbon dioxide curtain which surrounds the inlet of the gas capture device to prevent air from entering the capture device;

b. drawing carbon dioxide from the carbon dioxide curtain into the capture device to mix with the gases therein; and

c. introducing carbon into the capture device to react with carbon dioxide therein to form additional carbon monoxide.

4,256,467

A FLEXIBLE ABRASIVE COATED ARTICLE AND METHOD OF MAKING IT

Ian Gorsuch, Myrtle Cottage, 48 Millbank, Headcorn, Ashford, Kent, England

Filed Dec. 17, 1979, Ser. No. 104,341

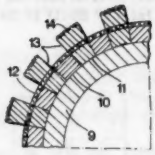
Claims priority, application United Kingdom, Dec. 12, 1978, 49361/78

Int. Cl.³ B24D *11/02*

U.S. Cl. 51—295 **11 Claims**

1. A method of making a flexible abrasive member in which a length of flexible, non-electrically conducting mesh material is laid onto a smooth electrically-conductive surface, a layer of metal is electro-deposited onto said smooth surface and thereby directly onto and through the mesh material in the presence of abrasive material so that the abrasive material becomes embedded in the metal layer and the metal layer is adhered to the mesh, and the mesh and the associated metal layer with embedded abrasive material is stripped from the electrically conductive surface to constitute the abrasive member.

8. A flexible abrasive member comprising a flexible non-electrically conductive mesh material, a layer of electro-deposited metal adhered directly to and extending through the mesh material so that the mesh material is embedded in the metal layer, the layer of metal having abrasive material embedded therein.



4,256,468

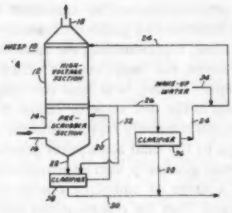
METHOD FOR CLEANING SINTER PLANT GAS EMISSIONS

Marshall R. Mazer, Allentown; Steven A. Jassund, Quakertown, and Stewart T. Herman, Hellertown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 865,359, Dec. 28, 1977, abandoned. This application Jul. 13, 1979, Ser. No. 57,230

Int. Cl.³ B03C *3/01, 3/16, 3/53*

U.S. Cl. 55—8 **10 Claims**



1. A method for removing particulates and condensable hydrocarbons from sinter plant emission gas streams that also contain acidic gases and soluble solids in which the sinter plant emission gas streams are passed through a wet electrostatic precipitator constructed of acid and corrosion resistant materials and having a pre-scrubber section with liquor spraying means for spraying aqueous liquor preceding a high voltage precipitator section that has a discharge electrode and a collector electrode which is washed with an aqueous liquor from a liquor dispensing means comprising:

(a) operating the wet electrostatic precipitator in an acidic mode with a pH range from about 2 to about 6.5 in both the pre-scrubber and high voltage sections,

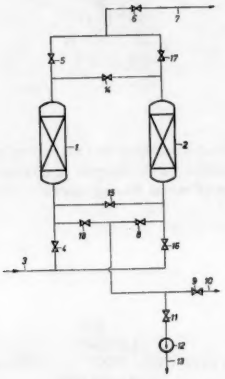
(b) collecting the pre-scrubber aqueous liquor, maintaining it within a pH range of about 2 to about 6.5 and recirculating it to the spraying means in a liquor recycle loop in the pre-scrubber section, and

(c) collecting the aqueous liquor draining from the collector electrode, maintaining it within a pH range of about 2 to about 6.5 and recirculating the aqueous liquor to the dispensing means for washing the collector electrode in a recycle loop in the high voltage section.

4,256,469
REPRESSURIZATION TECHNIQUE FOR PRESSURE SWING ADSORPTION

Paul Leitgeb, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 6, 1978, Ser. No. 957,783
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—25 **17 Claims**



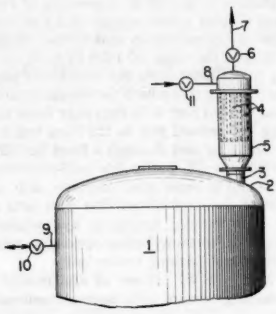
1. In a pressure swing adsorption process for the separation of a gaseous mixture comprising conducting the gaseous mixture under pressure over a carbon molecular sieve adsorbent in a pressurized adsorber having an inlet and an outlet, said adsorbent being capable of adsorbing at least one component selectively over the other components; discharging from said outlet a gaseous stream enriched in one or more other components; lowering the pressure above the adsorbent for regenerating purposes wit liberation of a gaseous stream enriched in at least the one component; repressurizing the adsorber; and repeating the cycle thereover, the improvement which comprises conducting said repressurizing in at least two stages, wherein the pressure buildup in the first stage or stages to an intermediate pressure is effected relatively rapidly, and the pressure buildup in the last stage to the final adsorption pressure is conducted substantially more gradually, said improvement resulting in the diminution of a surge of undesired component in the initial stream discharged from the repressurized bed.

4,256,470
PROCESS FOR THE DESTRUCTION OF FOAM

Otmar Zajicek; Jürgen Kirschner, both of Cologne; Helmut Klapp, Koln-Pesch, and Rainer Rompeltien, Cologne, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,843
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757345
Int. Cl.³ B01D *19/02*
U.S. Cl. 55—48 **8 Claims**

1. A process for the destruction of foam produced during the removal of residual monomers from an aqueous polymerizate dispersion having a tendency to foam consisting essentially of passing the gases being removed containing residual monomers through porous filter elements constructed of sintered materials and having a dimension of from 0.5 to 40 m^2, a porosity of from 15% to 85% and a maximum pore size of from 1 to 500μ, at such a rate that the difference in pressure through the filter elements does not exceed 25% of the original pressure, whereby foam in contact with said filter elements is destroyed,

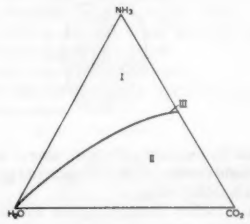


and the liquid portion of said destroyed foam is returned to said aqueous polymerizate dispersion.

4,256,471
PROCESS FOR THE SEPARATION OF AMMONIA AND CARBON DIOXIDE FROM MIXTURES CONTAINING AMMONIA, CARBON DIOXIDE AND WATER

Josephus J. P. M. Goorden, Sittard, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 16, 1979, Ser. No. 30,374
Int. Cl.³ B01D *53/14, 19/00*
U.S. Cl. 55—70 **16 Claims**



1. An improved process for the separate recovery of ammonia substantially free of carbon dioxide and water, and carbon dioxide substantially free of ammonia and water, from a mixture essentially containing ammonia and carbon dioxide, in which process:

an ammonia off-gas substantially free of carbon dioxide and water is separated by rectification in an ammonia separation zone, and the resulting residual liquid phase containing ammonia, carbon dioxide and water is removed therefrom and introduced into a carbon dioxide separation zone;

a carbon dioxide off-gas substantially free of ammonia and water is separated by rectification in a carbon dioxide separation zone and the resulting residual liquid phase containing ammonia, carbon dioxide and water is removed therefrom and introduced into a desorption zone; and

an off-gas containing ammonia, carbon dioxide and water vapor is separated from a liquid phase of desorption water substantially free of ammonia and carbon dioxide, and at least a portion of said off-gas is introduced into said ammonia separation zone;

said improvement comprising introducing into the portion of said ammonia separation zone from which said residual liquid phase is removed, a carbon dioxide containing gaseous phase in

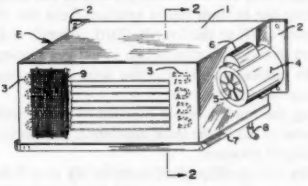
an amount sufficient to make the residual liquid phase removed therefrom lean with respect to ammonia.

4,256,472

MIST FILTER FOR EXTRACTING MOISTURE FROM OUTLET AIR FROM AUTO AIR CONDITIONER

Jack Atkins, Memphis, and William E. Cayce, Germantown, both of Tenn., assignors to Lifetime Industries, Memphis, Tenn.

Filed Sep. 4, 1979, Ser. No. 72,340
Int. Cl.³ B01D *51/00*; B60H *3/06*
U.S. Cl. 55—269 **2 Claims**



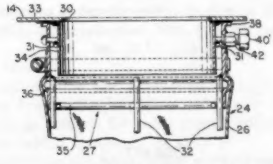
1. A combination of an automobile air conditioner including an evaporator and a filter for removing water from the moisture laden air passing through said evaporator, said filter maintained in thermal conductive contact with said evaporator upon its air downstream side thereof, said filter having a first layer of screen material, said screen material being corrugated, a second layer of screen material, said second layer of screen material also being corrugated and with the corrugations of the second layer of screen material being arranged contiguous with and perpendicular with respect to the corrugations of the first layer of screen material, fastener means holding said first and second layers of screen material in contiguity, said filter incorporating the juxtaposed corrugated layes of screen material and through the temperature differential between the chilled surface of the said evaporator and the warmer surface of the screen filter causing moisture to adhere particularly through capillary attraction on the said filter thereby effectively eliminating a substantial percent of the moisture from the moisture laden air passing through said evaporator and said filter.

4,256,473

FILTER BAG ATTACHING MEANS

Dominick De Martino, Windsor, Conn., assignor to The Spencer Turbine Company, Windsor, Conn.

Filed Oct. 5, 1979, Ser. No. 82,136
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—379 **9 Claims**



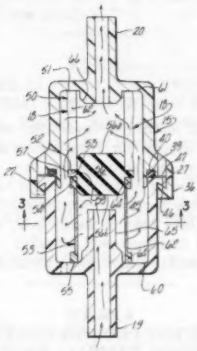
1. In an air filtering apparatus having a bag head, a bag filter assembly including a filter bag and a skeletal bag frame received within the filter bag and means for supporting the bag filter assembly on the bag head the improvement wherein said supporting means comprises a cylindrical bag head collar mounted on said bag head, a cylindrical bag frame collar mounted on said bag frame, one of the collars received in the other of the collars, a plurality of studs mounted in angularly spaced relation on one of said collars and projecting in one generally radial direction from said one collar, means for defining a thread on the other of said collars threadably engaged with said studs, and clamping means for releasably securing said collars in clamped relation to each other, said clamping means comprising one of said studs.

4,256,474

FILTER HOUSING AND FILTER ASSEMBLIES UTILIZING THE SAME

L. Joseph Berger, Jr., and Denis D. Guequierre, both of Birmingham, Mich., assignors to Finite Filter Company, Inc., Oxford, Mich.

Filed Nov. 20, 1978, Ser. No. 962,000
Int. Cl.³ B01D *46/42, 50/00*; B65D *6/02*
U.S. Cl. 55—482 **9 Claims**



1. A filter housing including a cup-shaped male portion having interior and exterior end and sidewalls, an axially extending inlet, and a plurality of radially and axially extending projections each having a ramp and a platform portion, a bell-shaped female portion having interior and exterior end and sidewalls, an axially extending outlet, an annular extension of said inner sidewall of said female portion, and an equal plurality of axially and radially extending receptors each having a ramp, a platform and a stop portion adapted to engage said projections upon the application of a twisting motion, and sealing means interposed between said male and said female portion adjacent the end walls thereof including an annular groove provided in the end wall of said female portion adjacent said annular extension, and an O-ring placed in said groove, wherein each of said ramp portions and said platform portions form an acute angle somewhat less than 90° with respect to said exterior sidewall to increasingly resist, in combination with said annular extension, disengagement of said male and said female portions as the pressure or vacuum inside said filter housing increases.

4,256,475

HEAT TRANSFER AND STORAGE SYSTEM

James P. Schafer, Little Falls, Minn., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 817,947, Jul. 22, 1977, abandoned. This application Nov. 15, 1978, Ser. No. 960,897
Int. Cl.³ F25B *27/00*
U.S. Cl. 62—2 **13 Claims**

1. A heat transfer and storage system for heating and cooling an enclosure, comprising:

a compressor for compressing vaporous refrigerant;

an indoor heat exchange coil located inside the enclosure;

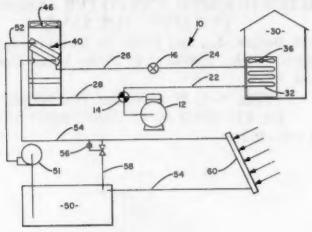
a refrigerant expansion device;

a refrigerant flow reversing means;

a three medium heat exchanger located outside the enclosure

and including a second heat exchange coil, a third heat exchange coil, heat transfer means thermally connecting the second and third coils, and means to pass ambient air over the second and third coils;

first connecting means connecting the compressor, the indoor heat exchange coil, the refrigerant expansion device, the refrigerant flow reversing means, and the second heat



exchange coil to form a reversible, vapor compression refrigeration system for transferring heat between the indoor coil and the three medium heat exchanger;

a heat storage facility for storing a heat transfer fluid; and

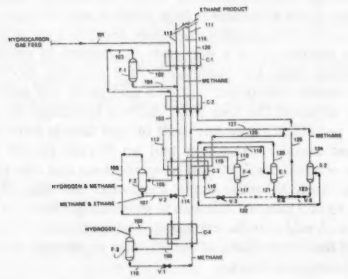
second connecting means connecting the heat storage facility and the third heat exchange coil, wherein the heat transfer fluid circulates and transfers heat between the heat storage facility and the three medium heat exchanger.

4,256,476

LOW TEMPERATURE PROCESS FOR THE RECOVERY OF ETHANE FROM THERMAL HYDROCRACKING VENT GASES

Edward H. Van Baush, Miami, Fla., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed May 4, 1979, Ser. No. 36,220
Int. Cl.³ F25J *3/06*
U.S. Cl. 62—23 **6 Claims**



1. A process for separating ethane from a gaseous feed comprising a mixture of hydrogen, alkanes, aromatics and alkyl aromatics comprising:

(a) feeding the gaseous feed to a first condenser to condense the aromatics and alkyl aromatics in the feed;

(b) feeding the product of (a) to a first phase separator to obtain an overhead vapor product and a bottom liquid product which contains substantially all of the aromatics present in the feed;

(c) feeding the overhead vapor product successively to a second and a third condenser to condense the ethane contained therein;

(d) feeding the product of (c) to a second phase separator to obtain an overhead vapor product and a bottom liquid product comprising primarily ethane;

(e) feeding the overhead vapor product of (d) to a fourth condenser to condense the methane contained therein;

(f) feeding the product of (e) to a third phase separator to obtain an overhead vapor product comprising primarily hydrogen and a bottom liquid product comprising primarily methane;

(g) feeding the overhead vapor product of (f) successively to the fourth, third, second, and first condensers and combining the bottom vapor product from the first phase separator of (b) with the overhead vapor product of (f) leaving the second condenser to obtain a product stream having ambient temperature and pressure and comprising the hydrogen and the aromatics present in the feed;

(h) feeding the bottom liquid product from the third phase separator in (f) to the fourth, third, second, and first condensers in succession to obtain a fuel gas stream comprising the methane present in the feed and having ambient temperature and pressure;

(i) feeding the bottom liquid product from the second phase separator of (d) to the third condenser to heat the liquid to a gas-liquid mixture;

(j) feeding the gas-liquid mixture of (i) to a fourth phase separator to obtain an overhead vapor product comprising primarily methane and a bottom liquid product comprising primarily ethane;

(k) throttling the liquid product of (i) and feeding the throttled product of the third condenser to heat the liquid product to form a gas-liquid mixture;

(l) feeding the gas-liquid mixture of (k) to a first ethane flash drum to obtain an overhead vapor product comprising methane and ethane and a bottom liquid product which is substantially pure ethane;

(m) feeding the overhead vapor product of (l) to the third condenser to condense the ethane;

(n) feeding the product of (m) to a second ethane flash drum to obtain an overhead vapor product containing primarily methane and a bottom liquid product containing primarily ethane;

(o) combining the bottom liquid products of steps (m) and (n) to form a liquid ethane-containing stream and feeding the ethane stream to the second and first condensers in succession to heat the ethane stream to ambient temperature and pressure; and

(p) combining the overhead vapor product from step (n) with the bottom product of (g) and feeding the combined product to the second and first condensers in succession.

4,256,477

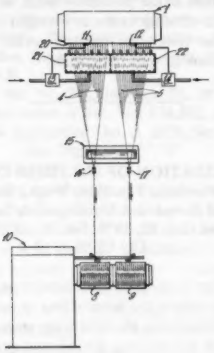
CLASS FIBER FORMING

Howard B. Moody, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 14, 1979, Ser. No. 103,783
Int. Cl.³ C03B *37/02*
U.S. Cl. 65—2 **13 Claims**

10. In combinations with a glass filament-forming bushing and a fluid introduction means for introducing a fluid into contact with said bushing, the improvement comprising temperature sensing means in contact with at least two loci positioned on the bottom surface of said bushing and control means

responsive to each of said sensing means, said control means being adapted to individually alter the characteristics of fluid



introduced from said fluid introduction means into contact with at least one of said loci.

4,256,478

METHOD FOR FORMING STABLE HIGH-VELOCITY GAS STREAM

Jun Matsumoto, Itami; Akira Tanigaki, Tsu; Nobuyoshi Ohsato, Itami; Nobuhiko Tokuda, Kawanishi, and Keihachiro Tanaka, Itami, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Japan

Filed May 2, 1979, Ser. No. 35,501
Claims priority, application Japan, May 8, 1978, 53/54802
Int. Cl.³ C03B *37/00*
U.S. Cl. 65—5 **8 Claims**

1. In a method for making glass fibers which comprises jetting a high-velocity gas stream of molten glass from a jet opening having an inside wall made of a platinum group metal, said wall being maintained at high temperature and fiberizing said molten glass, the improvement wherein said high-velocity gas stream has an oxygen content of 0 to 2% by volume, a stable flow and a constant kinetic momentum and said gas stream is jetted out from said jet opening at a velocity of 50 m/sec. to 2000 m/sec. at the opening portion of said jet opening at a pressure at least 0.5 kg/cm^2 higher than the pressure of an atmosphere into which it is jetted, whereby consumption of said platinum inside wall is reduced.

4,256,479

GRANULATION OF FERTILIZER BORATE

Cecil P. Harrison, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 939,541, Sep. 5, 1978, Pat. No. T986,002. This application Mar. 5, 1979, Ser. No. 17,522
Int. Cl.³ C05D *9/00*
U.S. Cl. 71—61 **7 Claims**

1. A process for the production of high-purity granular crystalline borate of a predetermined closely controlled particle size range suitable for subsequent fertilizer bulk-blending operations which comprises the steps of:

(1) maintaining in a horizontally inclined rotary pan a bed of fines recycled from a later-mentioned sizing step in continuous and alternating rising and cascading motion;

(2) introducing a stream of an inorganic acid selected from the group comprising sulfuric, phosphoric, and mixtures thereof, onto the upper active area of the cascading portion of said bed of fines;

(3) introducing a stream of particulate sodium tetraborate pentahydrate onto the upper active area of the cascading portion of said bed of fines juxtaposed said stream of said inorganic acid in step 2, the proportion of said stream of inorganic acid from step 2 to the proportion of said stream of particulate sodium tetraborate pentahydrate ranging from about 15 to about 20 percent by weight of the dry borate feed;

(4) maintaining the temperature of said bed of fines in said horizontally inclined rotary pan at about ambient temperature;

(5) maintaining the material introduced into said horizontally inclined rotary pan for a time sufficient to effect therein granules of crystalline borate ranging from about 66 percent to about 84 percent −6 +14 mesh Tyler;

(6) discharging continuously over the lower rim of said horizontally inclined rotary pan a granular, dry solid sodium tetraborate pentahydrate material; and

(7) sizing by screening said withdrawn material, returning the undersize or crushed oversize to the upper rim of said horizontally inclined rotary pan and withdrawing the onsize material as product.

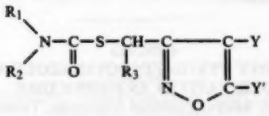
4,256,480

ISOXAZOLYL-ALKYL THIOCARBAMATES AND HERBICIDAL COMPOSITIONS THEREOF

Francois Guigues, Rillieux; Jacqueline Mourier, and Daniel Demozay, both of Lyon, all of France, assignors to Philagro, Lyon, France

Filed May 25, 1978, Ser. No. 909,645
Claims priority, application France, May 31, 1977, 77 17455
Int. Cl.³ A01N *47/12*; C07D *261/08*
U.S. Cl. 71—88 **6 Claims**

1. A compound of the formula:



in which R_1 and R_2 are identical or different and each represents a linear or Branched alkyl radical containing 1 to 4 carbon atoms, cyclohexyl or methoxyethyl, R_3 is a hydrogen atom or methyl group and Y and Y' are identical or different and each represents a hydrogen or methyl group.

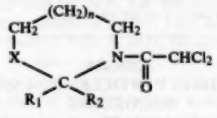
4,256,481

SELECTIVE HERBICIDE COMPOSITIONS

Ivan Gardi; Katalin Görög nee Privitzer; Sándor Gaál; Erzsebet Dudar; Maria Kocsis nee Bágyi, and Márta Tasnádi, all of Budapest, Hungary, assignors to Nitrokémia Ipartelepek, Füzfögyártelep, Hungary

Filed Mar. 2, 1979, Ser. No. 17,034
Int. Cl.³ A01N *43/86*; C07D *265/04, 279/04*
U.S. Cl. 71—88 **27 Claims**

1. A compound of the formula:



wherein

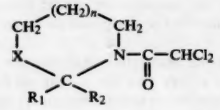
X is oxygen, sulfur, SO or SO_2;

n is 0 or 1; and

R^1 and R^2 together form an unsubstituted butylene, pentylene or hexylene ring, or a butylene, pentylene or hexylene ring substituted by 1 or 2 methyl groups.

20. A selective herbicide composition which comprises as an active ingredient at least one herbicidal compound selected from the group which consists of thiolcarbamate, triazine, chloroacetalinide, carbamide or phenoxyacetic acid herbicides

in admixture with 0.1 to 50% by weight of the herbicidal compound of a dichloroacetamide derivative of the formula:



wherein

X is oxygen, sulfur, SO or SO_2;

n is 0 or 1; and

R^1 and R^2 together form a butylene, pentylene or hexylene ring which is unsubstituted or substituted by 1 or 2 methyl groups.

4,256,482

HERBICIDAL COMPOSITION

Erwin Wittmann; Alfred Diskus, both of Linz, and Engelbert Auer, Leonding, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Sep. 21, 1979, Ser. No. 77,762

Claims priority, application Austria, Sep. 29, 1978, 7031/78

Int. Cl.³ A01N *43/66, 43/58*

U.S. Cl. 71—92 **6 Claims**

1. A herbicidal post-emergence-composition consisting essentially of, as active ingredients, effective herbicidal amounts of 0-[3-phenyl-6-chloro-pyridazin-4-yl]-S-(n-octyl)-thiocarbonate and 2-{[4-chloro-6-(ethylamino)-s-triazin-2-yl]amino}-2-methylpropionitrile.

4,256,483

2-ALKOXY PYRIDAZINOQUINAZOLINONE DERIVATIVES AS HERBICIDES

Shuichiro Asao, Ashiya; Yoshinori Nakayama, Takarazuka; Ryo Yoshida, Kawanishi; Seizo Sumida, Nishinomiya, and Shunichi Hashimoto, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

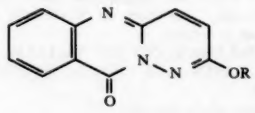
Filed Oct. 12, 1979, Ser. No. 84,435

Claims priority, application Japan, Oct. 17, 1978, 53-128097

Int. Cl.³ A01N *43/58*

U.S. Cl. 71—92 **2 Claims**

1. A herbicidal composition which comprises as an active ingredient a herbicidally effective amount of at least one of the compounds of the formula:



wherein R is a methyl group or an ethyl group, and an agriculturally acceptable inert carrier or diluent.

4,256,484

METALLIC IRON PARTICLES FOR MAGNETIC RECORDING

Richard H. Rodrian, Caseyville, Ill., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,797

Int. Cl.³ C22B *5/12*

U.S. Cl. 75—0.5 AA **7 Claims**

1. In the process for preparing a magnetically stable powder comprising the steps of

A. Reducing an iron oxide precursor selected from the group consisting of an iron oxide, an iron oxide hydrate, a modified iron oxide or a modified iron oxide hydrate with a gaseous reduction agent; and

B. Stabilizing the metallic powder thus produced, the improvement which comprises:

coating said iron oxide precursor with an antimony compound at a level of up to about 7 weight percent antimony based on the weight of the iron oxide content of said precursor prior to said reduction.

4,256,485

ENZYME OXIDATION OF SULFIDES IN MINERALS

Frederick J. Richardson, Tonasket, Wash., assignor to Northwest Ecological Research & Development, Inc., Omak, Wash.

Filed Oct. 11, 1979, Ser. No. 83,612

Int. Cl.³ C22B *1/11*

U.S. Cl. 75—6 **14 Claims**

1. A process for treating a solid mineral ore containing one or more contaminants in the form of free or combined sulfur as metal sulfides, comprising the following steps:

(a) reducing or pulverizing the mineral ore to granular or smaller particle size;

(b) forming a mixture of pulverized ore and water at room temperature;

(c) adding microorganisms in the form of baker's yeast or malt and a saccharide to the mixture of ore and water;

(d) allowing the mixture of step (c) to stand for a period sufficient for enzymatic action to carry a significant amount of free or combined sulfur into aqueous solution as sulfuric acid or a metal sulfate; and

(e) removing at least a portion of said sulphuric acid or metal sulphate from said aqueous solution.

4,256,486

MARTENSITIC STAINLESS STEEL HAVING EXCELLENT WELDABILITY AND WORKABILITY FOR STRUCTURAL USE

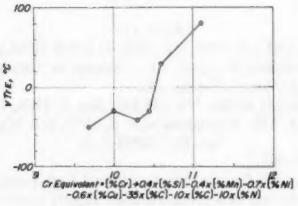
Keiichi Yoshioka, Chiba; Noboru Kinoshita; Yutaka Ono, both of Ichihara, and Nobuo Ohashi, Funabashi, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 31, 1979, Ser. No. 62,403

Claims priority, application Japan, Aug. 4, 1978, 53/94487

Int. Cl.³ C22C *38/16*

U.S. Cl. 75—125 **1 Claim**



1. Martensitic stainless steel having excellent weldability and workability for structural use consisting of not more than 0.02% of C, not more than 0.02% of N, 1.0–3.5% of Mn, not more than 1.0% of Cu, less than 0.1% of Ni, 10–13.5% of Cr, not more than 0.5% of Si, and the remainder being incidental impurities and iron and the following requirement being satisfied;

$$\text{Cr equivalent} = [\%Cr] + 0.4 \times [\%Si] - 0.4 \times [\%Mn] - 0.7 \times [\%Ni] - 0.6 \times [\%Cu] - 35 \times [\%C] - 10 \times [\%N] \geqq 10.5.$$

4,256,487

PROCESS FOR PRODUCING VANADIUM-CONTAINING ALLOYS

Olga S. Bobkova, 3 Rybinskaya ulitsa, 21, Korpus 2, kv. 212; Nikolai P. Slotvinsky-Sidak, Ambulatorny pereulok, 17, kv. 54; Oleg V. Travin, Pervomaiskaya ulitsa, 73, kv. 83, and Averky A. Frolov, Leningradsky prospekt, 14, kv. 16, all of Moscow, U.S.S.R.

Continuation of Ser. No. 792,306, Apr. 29, 1977, abandoned, which is a continuation of Ser. No. 554,542, Mar. 3, 1975, abandoned. This application Oct. 3, 1978, Ser. No. 948,652

Int. Cl.[3] C22C *27/02*

U.S. Cl. 75—134 V 5 Claims

1. A process for producing vanadium-containing alloys comprising the steps of melting in an electric furnace a charge containing vanadium pentoxide, vanadium converter slag preliminarily calcined with carbon, or mixtures thereof, and calcium oxide, in an amount providing the content of vanadium pentoxide in the melt of from 25 to 35 wt.%; discharging from said furnace said melt into a receptacle; adding to said melt a reducing agent containing silicon in an amount sufficient to reduce the vanadium pentoxide contained in said melt.

4,256,488

AL-MG-SI EXTRUSION ALLOY

Ronald J. Livak, Pullman, Wash., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 27, 1979, Ser. No. 79,349

Int. Cl.[3] C22C *21/16*

U.S. Cl. 75—142 10 Claims

1. An aluminum base dilute Al-Mg-Si extrusion alloy having a controlled excess of silicon characterized by lower hot flow stresses and reduced quench sensitivity as compared to Alloy 6063 while achieving the same strength levels of Alloy 6063 consisting essentially of 0.30 to 0.60% magnesium, 0.45 to 0.70% silicon, up to 0.35% iron, 0.14 to 0.30% copper, up to 0.05% chromium, up to 0.05% zirconium and up to 0.10% manganese wherein the silicon content does not exceed 0.30% plus the sum of 0.58 times magnesium content plus 0.25 times iron content.

4,256,489

LOW WEAR HIGH CURRENT DENSITY SLIDING ELECTRICAL CONTACT MATERIAL

Jan W. Van Wyk, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 10, 1979, Ser. No. 2,373

Int. Cl.[3] C10M *5/00, 7/00*

U.S. Cl. 75—173 R 9 Claims

1. A solid, wear resistant, electrical contact material for use in vacuum environments having a high temperature lubricant and low temperature lubricant in a silver matrix, said material consisting essentially of:

(a) from 0.5 to 8 percent by weight of a high temperature lubricant chosen from the group consisting of $AlPO_4$, BaF_2, and CaF_2 and combination thereof;

(b) from 2 to 24 percent by weight of chalcogenides of group V-B and VI-B of the Periodic Chart which exhibit lubricative properties; and,

(c) from 60 to 90 percent by weight silver as a matrix for said high temperature and low temperature lubricants.

4,256,490

COMPOSITION FOR DIFFUSION COATING OF FERROUS METALS

Inna I. Zaets, ulitsa Vorobieva, 11, kv. 8; Ivan D. Zaitsev, ulitsa Ekonomicheskaya, 1, kv. 31, both of Kharkov; Olga K. Yakshina, ulitsa 16 Parkovaya, 55, korpus 2, kv. 130; Nina F. Pershina, Kutuzovsky prospekt, 2/1, kv. 111, both of Moscow; Anatoly K. Gorbachev, prospekt Lenina, 31a, kv. 19; Ivan N. Gladky, ulitsa Bairona, 175, kv. 101, both of Kharkov; Nikolai M. Davydenko, ulitsa Komandarma Uborevicha, 14, kv. 45, and Grigory A. Tkach, ulitsa Frunze, 15, kv. 8, both of Kharkov, all of U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,128

Int. Cl.[3] C09D *5/08*

U.S. Cl. 106—1.12 5 Claims

1. A composition for diffusion coating ferrous metals, containing a particulate mixture of titanium in an amount of 51.5 to 64.0% by weight, chromium in an amount of 17.5 to 24.0% by weight, alumina in an amount of 15.0 to 21.25% by weight, an ammonium halide in an amount of 1.5 to 2.0% by weight, molybdenum in an amount of 0.75 to 1.5% by weight and boron in an amount of 1.0 to 2.0% by weight.

2. In a method which comprises protecting ferrous metals against corrosion by forming a diffusion coating thereon, said diffusion coating comprising titanium, chromium, alumina and an ammonium halide, the improvement which comprises applying a diffusion coating comprising a particulate mixture of titanium in an amount of 51.5 to 64.0% by weight, chromium in an amount of 17.5 to 24.0% by weight, alumina in an amount of 15.0 to 21.25% by weight, an ammonium halide in an amount of 1.5 to 2.0% by weight, molybdenum in an amount of 0.75 to 1.5% by weight and boron in an amount of 1.0 to 2.0% by weight.

4,256,491

WATERPROOFING COMPOSITION AND METHOD OF MAKING THE SAME

Dan C. Tate, Canton, N.C., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 829,867, Sep. 1, 1977, abandoned. This application Mar. 14, 1979, Ser. No. 20,257

Int. Cl.[3] C08L *1/00, 97/02;* C09K *3/18*

U.S. Cl. 106—2 14 Claims

1. A waterproofing composition consisting essentially of a mixture of primary sludge produced in the course of pulp and paper mill operations, at least 20 volume percent of which is wood fibers, and tall oil pitch.

4,256,492

MARKER INK FOR WRITING BOARD

Kenji Matsumoto, Kokubunji; Shintaro Hishikawa, and Yoshikatsu Ito, both of Urawa, all of Japan, assignors to Taihei Chemicals Ltd. and Matsumoto Textile & Chemical Consultants Co., both of Tokyo, Japan

Filed Dec. 12, 1978, Ser. No. 968,819

Claims priority, application Japan, May 2, 1978, 53-52255; May 23, 1978, 53-60599; Nov. 9, 1978, 53-137342

Int. Cl.[3] C09D *11/00*

U.S. Cl. 106—22 11 Claims

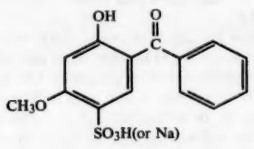
1. A colored marker ink for use on a writing board and capable of forming opaque marker traces on the board, which consists essentially of: a uniformly blended mixture of a colorant, a resin and a mixed solvent consisting of at least one solvent for the resin selected from the group consisting of acetone, methylethyl ketone, methyl acetate, ethyl acetate, methanol, ethanol and nitro methane and at least one non-solvent for the resin selected from the group consisting of n-butanol, iso-propyl alcohol, toluol, xylol and n-butyl acetate, the mixing ratio of the solvent to the nonsolvent being within the range from 70:30 to 60:40.

4,256,493
JET INK COMPOSITION

Sigeaki Yokoyama, Sagamihara; Tsunehiko Toyoda, and Noriaki Okamura, both of Yokohama, all of Japan, assignors to Dai Nippon Tokyo Co., Ltd., Osaka, Japan

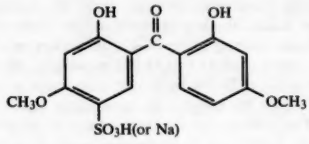
Filed Oct. 4, 1979, Ser. No. 81,930
Int. Cl.[3] C09D *11/00*
U.S. Cl. 106—22 4 Claims

1. A jet ink composition comprising an aqueous jet ink containing a water-soluble dye, a wetting agent and water as main components and, incorporated therein, a water-soluble ultraviolet absorbing agent, which is the compound of formula I



(I)

or the compound of formula II



(II)

4,256,494
ERASABLE INK COMPOSITION FOR WRITING ON AN IMPERVIOUS SURFACE

Masaji Yamamoto, Amagasaki; Keiko Shioi, Daito, and Kimio Murakami, Osaka, all of Japan, assignors to Sakura Color Products Corp., Osaka, Japan

Filed Oct. 25, 1979, Ser. No. 87,924
Claims priority, application Japan, Oct. 20, 1978, 53-129869; Dec. 28, 1978, 53-162724
Int. Cl.[3] C09D *11/00*
U.S. Cl. 106—22 7 Claims

1. An erasable ink composition for writing on an impervious surface which comprises:

about 40–90% by weight of an organic solvent;

about 1–10% by weight of a pigment;

about 1–25% by weight of a separating agent which is a non-volatile or only slightly volatile liquid at normal temperatures and has a lower vapor pressure than the solvent; and is soluble in the solvent;

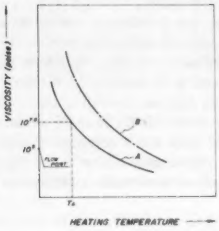
about 0.5–20% by weight of a synthetic resin which is soluble both in the solvent and a solution of the separating agent in the solvent, and is insoluble or only slightly soluble in the separating agent, said synthetic resin being at least one member selected from the group consisting of polyvinyl butyral, a vinyl chloride-vinyl acetate copolymer, a vinylidene chloride-acrylonitrile copolymer, ethyl cellulose, and acetyl cellulose; and

about 0.05–20% by weight of a hydrocarbon wax.

4,256,495
SEALING GLASS

Hiromitsu Kawamura; Akira Misumi, both of Mobara, and Kozo Odawara, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 910,531, May 30, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,618
Claims priority, application Japan, Sep. 21, 1977, 52-112685
Int. Cl.[3] C03C *3/10*
U.S. Cl. 106—53 2 Claims



1. Non-conductive sealing glass of not greater than about 10μ average grain diameter consisting of 100 parts by weight of a composition consisting of 20–30 mole % of B_2O_3, 60–69 mole % of PbO, 0–10 mole % of ZnO, 0–6 mole % of CuO and 0.5–2.0 mole % of Bi_2O_3; and 1–5 parts by weight of either one of SiO_2 and Al_2O_3.

4,256,496
PRODUCTION OF METAL CARBIDES IN PURE FORM

Hans G. Brandstatter, Welland, Canada, assignor to Ontario Research Foundation, Mississauga, Canada

Continuation-in-part of Ser. No. 861,507, Dec. 16, 1977, abandoned, which is a continuation of Ser. No. 494,927, Aug. 5, 1974, abandoned. This application Nov. 9, 1978, Ser. No. 959,201
Int. Cl.[3] C04B *35/52*
U.S. Cl. 106—43 7 Claims

1. A method for the formation in substantially pure solid form of a metal carbide of a metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, uranium, tungsten, manganese, iron and mixtures thereof, which comprises:

forming a blend of finely divided carbon and a finely divided ore or concentrate thereof, said ore or concentrate thereof containing said metal in oxide, carbonate and/or hydroxide form and gangue constituents comprising at least one oxide selected from the group consisting of silica, alumina, magnesia and lime,

said carbon being present in said blend in an amount at least sufficient to convert all said metal in oxide, carbonate and/or hydroxide form in said ore or concentrate thereof to a corresponding metal carbide,

heating said blend in a reaction zone to a temperature at least sufficient to initiate and sustain a single step solid state reducing and carburization reaction between said carbon and said metal in oxide, carbonate and/or hydroxide form to convert substantially all said metal in oxide, carbonate and/or hydroxide form to a corresponding solid metal carbide in accordance with the schematic equation:

$$MeO+2C \rightarrow MeC+CO$$

wherein MeO is the metal in oxide, carbonate and/or hydroxide form and MeC is the metal carbide, while removing carbon monoxide evolved in said solid state reaction from said reaction zone,

the temperature of said heating in said solid state reaction being insufficiently high to result in significant reduction of said gangue constituents, whereby said gangue constit-

uents are left substantially unaffected by said solid state reaction, and,

after completion of said solid state reaction, physically separating said solid metal carbide in substantially pure form from said unaffected solid gangue constituents.

4,256,497

LEAD-FREE GLAZE FOR ALUMINA BODIES

Randy O. Knapp, Cottam, Canada, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Feb. 8, 1980, Ser. No. 119,938

Int. Cl.³ C03C 5/02; C04B 33/26

U.S. Cl. 106—48 **6 Claims**

1. A lead-free and barium-free ceramic glaze for application to sintered high alumina substrates and maturing at temperatures from 1800° to 2200° F. consisting essentially of from 35 to 54 percent SiO_2, from 7 to 11 percent Al_2O_3, from 17 to 25 percent B_2O_3, from 2 to 3 percent CaO, from 2 to 2½ percent ZnO, from 4½ to 5 percent Na_2O, from 8½ to 21 percent SrO, and from 0.7 to 1 percent of a mixture of K_2O, Li_2O, and MgO.

4,256,498

PROCESS FOR THE MANUFACTURE OF REFRACTORY WARE

Emil K. Köhler, Gro Balmerode, Fed. Rep. of Germany, assignor to Bibrach & Rehberg, Goettingen, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,799

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739722; Jul. 27, 1978, 2832946

Int. Cl.³ C04B 33/32

U.S. Cl. 106—55 **7 Claims**

1. In a process for burning ware of a size greater than 150 kg and having a wall thickness greater than 200 mm to form refractory products, the improvement which comprises processing the ware through a tunnel kiln and surrounding the ware with heat-resistant muffling or upright lattice work so as to maintain a substantially uniform temperature gradient around the ware.

4,256,499

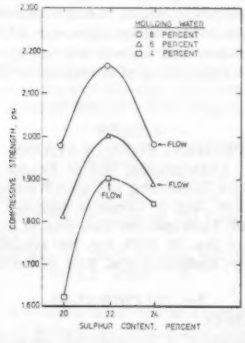
SULFUR CONCRETE COMPOSITION AND METHOD OF MAKING SHAPED SULFUR CONCRETE ARTICLES

Ronald L. Terrel, Seattle, Wash., assignor to Sulphur Development Institute of Canada, Alberta, Canada

Filed Sep. 7, 1979, Ser. No. 73,503

Int. Cl.³ C04B 33/04

U.S. Cl. 106—70 **15 Claims**



1. A method of producing a shaped sulphur concrete article consisting essentially of:

(a) providing a moldable mixture consisting essentially of a particulate mineral aggregate, a particulate mineral binding agent, a liquid vehicle and a particulate sulphur component selected from the group consisting of elemental sulphur and modified elemental sulphur,

(b) compacting and forming the mixture into a shaped body of structural integrity, bonded by said particulate mineral binding agent,

(c) drying the shaped body at a temperature below the melting or softening point of the sulphur component to drive off said liquid vehicle and form a dried body substantially free of said liquid,

(d) heating the dried body to a temperature effective to melt the sulphur component in the dried body, said fine particulate mineral binding agent being effective to maintain the molten sulphur component distributed throughout the body during the heating and to prevent drainage or movement of the molten sulphur component to a lower part of the body, and

cooling the body to solidify the sulphur component and form a shaped article bonded by a matrix of the solid sulphur component.

4,256,500

POZZOLAN CEMENT COMPOSITIONS

Raymond C. Turpin, Jr., Atlanta, Ga., assignor to The Partners Limited, Atlanta, Ga., a part interest

Continuation of Ser. No. 899,699, Apr. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 823,321, Aug. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 721,050, Sep. 7, 1976, abandoned. This application Feb. 12, 1980, Ser. No. 120,838

Int. Cl.³ C04B 7/02

U.S. Cl. 106—88 **50 Claims**

1. A cement composition consisting essentially of:

cement, a pozzolan material, fine aggregate, air, water, at least one alkali metal constituent selected from the group consisting of sodium, potassium, and lithium ions, and at least one iron complexing anionic constituent which is capable of forming complexes with ferric ions, is soluble in water, and forms a calcium salt which is also water soluble;

the alkali metal constituent being present in an amount up to approximately 4.0 percent by weight, in terms of the equivalent weight of sodium ions, of the pozzolan material;

the iron complexing anionic constituent being present in an amount up to approximately 6.0 percent by weight, in terms of the equivalent weight of chloride ions, of the pozzolan material; and

the cement composition being further characterized by:

(a) having a solid volume ratio of cement to the pozzolan material within the range of approximately 0.05 to 2.0;

(b) having a ratio of the volume of paste (pozzolan material, cement, air, and water) to the solid volume of sand within the range of approximately 0.75 to 2.5; and

(c) having a ratio of the solid volume of cement to the volume of mortar less than about 0.19.

4,256,501

ROCK TREATING METHOD AND COMPOSITIONS

George M. Banino, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1979, Ser. No. 62,926

Int. Cl.³ C04B 7/02

U.S. Cl. 106—97 **18 Claims**

13. A concrete mixture comprising portland cement and at least 30% by weight of aggregate treated with a composition comprising by weight

(A) 1% to 30% of an organic aryl condensation polymer having at least 20 mole percent of chemically combined dioxyarylene units of the formula,

—ORO—,

based on the total moles of the intercondensed units,

(B) 0.1% to 10% of an aliphatic polyamine, and
(C) 98.9% to 60% of an organic solvent,
based on the total weight of (A), (B) and (C), where R is a divalent $C_{(6-30)}$ arylene radical.

4,256,502

METHOD OF PREPARING CEMENT CLINKER FROM CARBONIFEROUS SHALE

Jean-Pierre Lovichi; Bernard LeBras; Robert Guyot, and Francois Guilmin, all of Montelimar, France, assignors to Lafarge Conseils et Etudes, Paris, France

Filed Jun. 12, 1979, Ser. No. 47,740
Claims priority, application France, Jun. 12, 1978, 78 17527
Int. Cl.[3] C04B *7/44*
U.S. Cl. 106—100 **4 Claims**

1. In a method of preparing cement clinker from a mineral raw material capable of releasing calorific energy, such as carboniferous shale, in an installation comprising:
a rotary clinkerization kiln associated to a clinker cooler;
an exchanger column connected to said kiln and including a plurality of superimposed exchanger cyclones and an exchanger precalcinator, and;
a raw material treating column connected to said kiln and including a plurality of superimposed treating cyclones which comprise, from top to bottom, at least one first, one second, one third and one fourth treating cyclone, said treating column further comprising a treating calcinator,
the improvement comprising the steps of:
(a) feeding said exchanger column only with additive substances adapted to be used in combination with said raw material for making said clinker, and partially decarbonating said additive substances in said exchanger column prior to introducing said substances into said kiln, and introducing into said exchanger column the gases issuing from said cooler;
(b) feeding the gases issuing from said cooler into said exchanger column through said exchanger precalcinator;
(c) feeding said treating column with said raw material by introducing the same into a flow path leading from the fourth treating cyclone to said treating calcinator;
(d) feeding fumes issuing from said kiln into said third treating cyclone,
(e) injecting a portion of the solid matter issuing from said second cyclone into a gas flow path leading from said second cyclone to said first cyclone;
(f) injecting the remaining solid matter issuing from said second cyclone into said flow path connecting said fourth treating cyclone to said treating calcinator,
(g) injecting the fumes issuing from said treating calcinator into a flow path through which said fumes issuing from the kiln are fed into said third treating cyclone;
(h) feeding at least a portion of the solid matter issuing from said fourth treating cyclone and the solid matter issuing from said treating calcinator into said kiln.

4,256,503

METHOD FOR EFFECTIVELY UTILIZING WASTE TIRES

Akikazu Tsuda, Yokohama; Motokazu Kikuchi, Akigawa; Tadatoshi Shimazaki, Higashimurayama; Toshio Tsuji, Hinode; Shunro Ueda, Hinode, and Masamichi Kabaya, Hinode, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,660
Claims priority, application Japan, Jan. 31, 1979, 54-10167
Int. Cl.[3] C04B *7/44*
U.S. Cl. 106—100 **3 Claims**

1. A method for effectively utilizing waste tires in an apparatus for burning cement by means of a rotary kiln, comprising the steps of; charging waste tires directly without crushing or crushed waste tire pieces as fuel to a position in said kiln where the gas temperature in this apparatus is 600°–1,400° C., said charging in an amount not exceeding 60% of the total fuel use calculated as heat energy.

4,256,504

FLY ASH-BASED CEMENT

Edwin R. Dunstan, Jr., Lakewood, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 16, 1979, Ser. No. 85,452
Int. Cl.[3] C04B *11/10*
U.S. Cl. 106—109 **5 Claims**

1. A cement composition consisting essentially of (1) a major proportion of a fly ash having a calcium content greater than about 20 percent by weight and (2) about 5 to 15 percent by weight of calcium sulfate.

4,256,505

HOT MELT COMPOSITIONS

Maurice L. Zweigle, Midland, and Janet C. Hickman, Rhodes, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 926,488, Jul. 20, 1978, abandoned. This application Apr. 10, 1979, Ser. No. 28,775
Int. Cl.[3] C08L *1/10, 1/26*
U.S. Cl. 106—171 **28 Claims**

1. A hot melt composition comprising a cellulosic wherein the cellulosic is a cellulose ether or cellulose ester, an oil extender and from about 0.2 to about 15 weight percent of a surfactant based on the weight of the cellulosic and oil extender, wherein the surfactant is employed in an amount sufficient to measurably reduce the oil exudation from a solidified composition of the cellulosic and oil extender or visually improve the compatibility of the components in the solidified composition.

4,256,506

ASPHALT COMPOSITION FOR ASPHALT RECYCLE

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 488,518, Jul. 15, 1974, Pat. No. 4,000,000. This application Oct. 20, 1976, Ser. No. 734,292
The portion of the term of this patent subsequent to Dec. 28, 1993, has been disclaimed.
Int. Cl.[3] C08L *95/00;* **C08J** *3/18*
U.S. Cl. 106—280 **7 Claims**

1. In a process for treating used asphalt-aggregate composition comprising heating and mixing said composition, the improvement comprising adding to said composition a composition consisting essentially of a petroleum hydrocarbon having over 55% aromatics, and asphalt and mixing the resulting composition at a temperature of at least about 200° F.

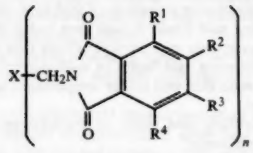
4,256,507

PIGMENT FORMULATIONS

Joachim Kranz, Ludwigshafen; Rudolf Polster, Frankenthal; Reinhard Sappok, Heidelberg, and Alois Wiesenberger, Lambsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,382
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905114
Int. Cl.[3] C09B *67/00*
U.S. Cl. 106—288 Q **8 Claims**

1. A formulation of a flavanthrone, pyranthrone, indanthrone, indigo, quinacridone, perylene-3,4,9,10-tetracarboxylic acid dianhydride or perylene-3,4,9,10-tetracarboxylic acid diimide pigment which contains from 0.5 to 15% by weight, based on pigment, of one or more compounds of the general formula



(I)

where X is an n-valent radical of a flavanthrone, pyranthrone, indigo, quinacridone, perylene-3,4,9,10-tetracarboxylic acid dianhydride or perylene-3,4,9,10-tetracarboxylic acid diimide pigment, R^1, R^3 and R^4 independently of one another are hydrogen or chlorine, R^2 is hydrogen, chlorine, carboxyl, bromine, nitro, N-C_1–C_5-alkylcarbamyl, N-phenylcarbamyl or benzoylamino and n is 1, 2, 3 or 4.

4,256,508

IRON OXIDE PIGMENTS WITH IMPROVED COLOR STRENGTH

Arvind S. Patil, Grosse Ile, Mich., and Lowell E. Netherton, Summit, N.J., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 29, 1979, Ser. No. 53,236
Int. Cl.³ C09C *1/24*
U.S. Cl. 156—304 **15 Claims**

1. In the process for the production of transparent iron oxide pigments by reacting an aqueous solution of a water-soluble iron salt with an alkaline precipitating agent, the improvement comprising adding a fluoride salt to said solution or to the reaction product.

4,256,509

PHYSICAL MODIFICATION OF THE VISCOSITY CHARACTERISTICS OF STARCHY FLOURS

John V. Tuschhoff; James E. Eastman, and Schanefelt Robert V., all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed May 14, 1979, Ser. No. 38,619
Int. Cl.³ C13L *1/08*
U.S. Cl. 127—32 **13 Claims**

1. A method of making a modified starch-containing flour having thin-thick viscosity characteristics so that when an aqueous slurry of said modified flour is heated under retorting conditions it will initially have a thin viscosity and subsequently thicken upon continued retorting thereof, said method comprising the steps of: (a) forming an aqueous alcohol slurry of said flour with an aqueous alcohol containing from about 80% to about 95% by weight alcohol and from about 5% to about 20% water, (b) heating said slurry to a temperature of at least 140° C. (284° F.) for a period of time sufficient to modify said flour in said slurry to a granular thin-thick flour; and (c) recovering the granular thin-thick flour from said slurry.

4,256,510

METHOD OF SCRAPING CORNERS

David E. Thompson, Stonegate, Fox Run Rd., Norwalk, Conn. 06850, and Walter R. G. Haggstrom, 116 Canton Ave., Portsmouth, R.I. 02871

Filed Aug. 11, 1978, Ser. No. 932,919
Int. Cl.³ B08B *7/00*
U.S. Cl. 134—6 **1 Claim**

1. A method of scraping material from a region proximate to the intersection of at least two intersecting non-coplanar surfaces, the steps of said method including:

(A) providing a rotary scraper having:

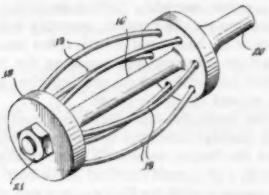
(1) a longitudinally extending scraper hub having a front end surface and a rear end surface,

(2) a plurality of longitudinally extending rotatable scraper blades mounted to the front end of said scraper hub and extending in a direction forwardly of said front end surface of said scraper hub,

(3) means for rotating said scraper hub to cause rotation of said plurality of scraper blades, and

(4) a second rotary scraper hub having the forwardly extending ends of each of said plurality of scraper blades mounted to said second rotary scraper hub,

(B) positioning said rotary scraper relative to said at least two intersecting surfaces to be scraped such that the plane of rotation of said plurality of rotatable scraper blades is



substantially perpendicular to the plane of each of said at least two intersecting surfaces,

(C) rotating said plurality of rotatable scraper blades so that the longitudinal portions of each of said rotatable scraper blades strikes against each of said at least two surfaces to be scraped,

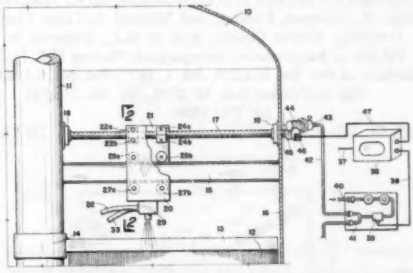
whereby the impact of said longitudinal portions of each of said plurality of rotatable scraper blades against said at least two intersecting surfaces results in removal of material from said urfaces.

4,256,511

HIGH ENERGY WASH OF LJUNGSTROM AIR PREHEATER

Hugh C. Atchison, and Bobby G. Simmons, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 17, 1979, Ser. No. 75,914
Int. Cl.³ B08B *3/02, 9/00*
U.S. Cl. 134—46 **18 Claims**



1. An apparatus for cleaning the basket section of an air preheater, the basket section being enclosed within a chamber and rotatable around a hub positioned in the chamber, the apparatus comprising;

an elongate beam spaced from and parallel to the basket section, the beam having an inner end secured to the hub and an outer end secured to the inside wall surface of the chamber;

an elongate threaded rod spaced from and parallel to the beam, the rod having an inner end mounted in a rotatable bearing member secured to the hub, the rod having an outer end which extends beyond the chamber wall, and the rod being carried near the outer end in a rotatable

bearing member secured to the inside wall surface of the chamber;

a drive unit mounted outside of the chamber, and the drive unit engaging the outer end of the threaded rod, such that the rod can be rotated by the drive unit;

a carriage assembly which straddles the threaded rod and the beam, the carriage assembly including at least one carriage drive block, the drive block being secured to the carriage assembly and having a central threaded opening therein which engages the threaded rod, to thereby enable the carriage assembly to move along the threaded rod as the rod rotates;

the carriage assembly further including top roller means mounted on the carriage assembly and engaging the top face of the beam, and bottom roller means mounted on the carriage assembly and engaging the bottom face of the beam, said roller means enabling the carriage assembly to be moved along the beam;

a nozzle assembly which includes a head block fastened onto the carriage assembly between the bottom roller means and the basket section, a fluid passage inside the head block, a jet nozzle installed in the head block and in communication with the fluid passage and at least one inlet line which connects the fluid passage with a source of washing fluid;

an automatic programmer unit which includes a means for actuating the drive unit, a first counter means associated with the basket section, and a second counter means associated with the drive unit actuating means and with the threaded rod; wherein

the washing fluid is directed through the inlet line and jet nozzle and onto the basket section, to thereby remove solid deposits from the basket section;

the first counter means is adapted to register one complete revolution of the rotating basket secton and to actuate the second counter means after registering each complete revolution of the basket section; and

the second counter means is adapted to actuate the drive unit actuating means, to cause the threaded rod to rotate a set number of revolutions, as registered by the second counter means, and to thereby advance the carriage assembly a predetermined distance along the threaded rod.

4,256,512

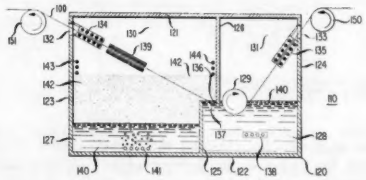
FLEXIBLE CIRCUIT REFLOW SOLDERING MACHINE

Hans H. Ammann, Chester, and Michael A. Oien, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 812,230, Jul. 1, 1977, Pat. No. 4,115,601. This application Jun. 15, 1978, Ser. No. 915,921

Int. Cl.³ B05C *11/02*

U.S. Cl. 134—64 R **18 Claims**



1. A machine for processing reflowable solder plated flexible circuit webs comprising:

an enclosure containing first and second sumps and first and second chambers, said first chamber spanning said first sump and a portion of said second sump and said second chamber spanning the remainder of said second sump, each of said chambers having a port therein;

a single noncorrosive fluid having a boiling point at atmospheric pressure sufficiently in excess of the liquidus temperature of the solder to be reflowed, said fluid in its liquid state occupying said first and second sumps and in its vapor state occupying a portion of said first chamber;

means for boiling said liquid in said first sump to generate said vapor occupying said portion of said first chamber;

means for maintaining said liquid in said second sump at a temperature such that said solder temperature is below its eutectic point;

means for controlling said vapor at a predetermined level above said first sump;

means for moving said web through said vapor occupying said portion of said first chamber, said vapor melting said solder causing it to reflow, said web being moved along a plane oriented at a predetermined angle with respect to a horizontal plane such that said solder is maintained at a generally uniform thickness while molten; and

means for cooling said solder after exiting from said vapor.

4,256,513

PHOTOELECTRIC CONVERSION DEVICE

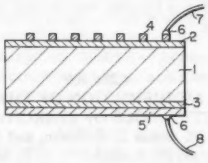
Manabu Yoshida, Katano; Jun Fukuchi, and Shigetoshi Takayanagi, both of Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 16, 1979, Ser. No. 85,205

Claims priority, application Japan, Oct. 19, 1978, 53-129116; Oct. 19, 1978, 53-129131; Oct. 20, 1978, 53-129625; Feb. 2, 1979, 54-11685

Int. Cl.³ H01L *31/00*

U.S. Cl. 136—256 **5 Claims**



1. A photoelectric conversion device comprising a semiconductor substrate of one conductivity type, an impurity diffused layer formed in one of the major surfaces of said semiconductor substrate and having a conductivity type opposite to that of said semiconductor substrate, and an electrode deposited on that substrate surface making ohmic contact with said impurity diffused layer, said electrode being formed from a mixture of materials including silver, gold and a Zn compound based glass to which aluminum or antimony is added, said glass containing no lead compound.

4,256,514

METHOD FOR FORMING A NARROW DIMENSIONED REGION ON A BODY

Hans B. Pogge, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,604

Int. Cl.³ H01L *21/22, 21/26, 21/285, 21/308*

U.S. Cl. 148—1.5 **19 Claims**

9. A method for forming integrated circuits having a narrow dimensioned region on a silicon body comprising:

providing a silicon body;

forming a first insulating layer on a major surface of said body;

forming on said layer a polycrystalline silicon layer;

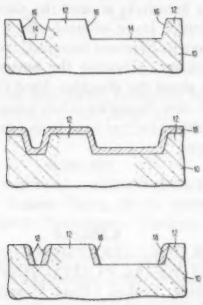
forming an opening in said polycrystalline silicon layer by reactive ion etching which results in the structure having substantially a horizontal surface and a substantially vertical surface;

said substantially vertical surface is equal to or less than about 5° from the vertical and having a uniformly positive

slope wherein the uppermost intersection of said vertical surface with a major horizontal surface does not overhang the lowermost intersection of said vertical surface with a major horizontal surface;

forming a second insulating layer on both said substantially horizontal surface and said substantially vertical surface; and

reactive ion etching said second insulating layer to substantially remove said horizontal layer and to provide said narrow dimensioned region on said silicon body.



10. The method of claim **9** wherein said second insulating layer is completely removed in said narrow dimensioned region and further comprising diffusing an impurity through said narrow dimensioned region into said silicon body.

11. The method of claim **9** wherein said second insulating layer is removed except for a thin screen layer in said narrow dimensioned region and further comprising ion implanting an impurity through said narrow dimensioned region into said silicon body.

4,256,515

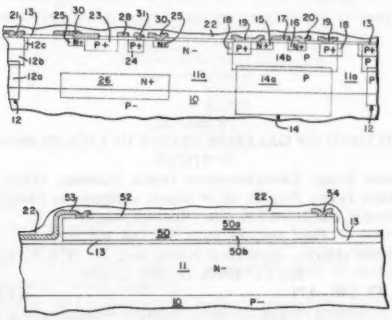
METHOD FOR MAKING INTEGRATED CIRCUIT WITH C-MOS LOGIC, BIPOLAR DRIVER AND POLYSILICON RESISTORS

Steven W. Miles, Dudley, and Paul R. Emerald, Sterling, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Division of Ser. No. 939,506, Sep. 5, 1978. This application Oct. 26, 1979, Ser. No. 88,686

Int. Cl.[3] **H01L** *21/265, 21/20*

U.S. Cl. 148—1.5 **5 Claims**



1. A method for making an integrated circuit having a complimentary pair of MOS transistors, a PNP transistor, an NPN transistor and a resistor comprising:

(a) growing an N-type epitaxial layer over the face of a P-type silicon crystal wafer;

(b) electrically isolating a first, second and third pocket from each other in said epitaxial layer;

(c) selectively doping said epitaxial layer from the outer surface thereof to form a complimentary pair of MOS transistors in said first pocket, an NPN transistor in said second pocket and a PNP transistor in said third pocket;

(d) forming an insulative film over said surface;

(e) depositing a polysilicon sheet over said entire surface on said film;

(f) doping by ion implantation said polysilicon sheet so that substantially all of said implanted ions remain within said sheet;

(g) selectively removing portions of said sheet to form an ion implanted polysilicon resistor body;

(h) heating to anneal said ion implanted resistor body; and

(i) providing aluminum film electrical connections to said resistor and to said transistors.

4,256,516

METHOD OF MANUFACTURING NON-MAGNETIC FE-MN STEELS HAVING LOW THERMAL EXPANSION COEFFICIENTS AND HIGH YIELD POINTS

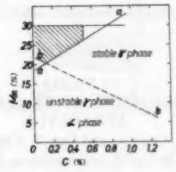
Chiaki Ouchi, and Yohji Kohsaka, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

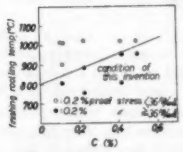
Filed Dec. 18, 1979, Ser. No. 104,754

Claims priority, application Japan, Dec. 26, 1978, 53-159206; Jan. 30, 1979, 54-8770

Int. Cl.[3] **C22C** *37/00, 39/54;* **C21D** *7/13*

U.S. Cl. 148—12 R **2 Claims**





1. A method of manufacturing non-magnetic steel having a low thermal expansion coefficient and a high yield point comprising the steps of:

preparing a slab or ingot containing less than 0.5% by weight of carbon, less than 2% by weight of silicon, 20–30% by weight of manganese, 0.005–0.04% by weight of nitrogen and the balance of iron and impurities, in which the following relationships are simultaneously satisfied

$$Mn(\%) > 16 \times C(\%) + 18 \quad (1)$$

$$Mn(\%) > -12 \times C(\%) + 21.5 \quad (2)$$

heating said slab or ingot to a temperature of less than 1220° C.

hot rolling the slab or ingot, and

finishing rolling at a temperature less than 800° C.+400° C.×C(%).

4,256,517

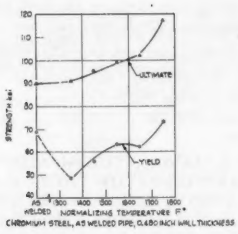
WELDED ALLOY CASING

George M. Waid, Burton, and Anthony T. Davenport, Shaker Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 868,261, Jan. 9, 1978, Pat. No. 4,189,333. This application Sep. 4, 1979, Ser. No. 72,172

Int. Cl.³ C22C *38/06*

U.S. Cl. 148—36 **2 Claims**



1. A normalized, rolled and welded tubular product having a wall thickness of about ⅜ inch or more formed of an aluminum-killed steel consisting essentially of from 0.28 to 0.40% carbon, from 1.00 to 1.75% manganese, from 0.15 to 0.50% silicon, from 0.20 to 1.00% chromium, and the balance iron, said steel being further characterized by a yield strength of about 55 to 80 ksi and a minimum ultimate tensile strength of about 95 ksi.

4,256,518

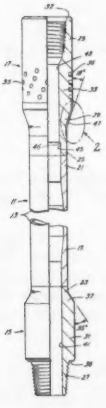
WELDING AND AUSTENITIZING EARTH BORING APPARATUS

Jimmie B. Bolton, Conroe, and Sam T. Crews, Houston, both of Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 887,005, Mar. 16, 1978. This application Jun. 18, 1979, Ser. No. 49,351

Int. Cl.³ C21D *1/18*

U.S. Cl. 148—127 **7 Claims**



1. Method of manufacture of a box tool joint member comprising providing a tubular body of hardenable steel having a tapered shoulder on its outer periphery with an annular groove in the outer periphery of the body extending over the shoulder into the smaller diameter portion of the body adjacent the smaller diameter portion of the shoulder, welding into the groove a butter layer of steel which by heat treatment alone cannot have its hardness increased over 255 Brinell, heat treating the member, making an annular groove in the butter layer extending over the shoulder into said smaller diameter portion, and hard facing the butter layer.

7. Method of preserving a box tool joint member which has a tubular body of hardenable steel having a tapered shoulder on its outer periphery comprising grooving the outer periphery of the body annularly around the shoulder, welding into the groove a butter layer of steel which by heat treatment alone cannot have its hardness increased over 255 Brinell, heat treating the member, grooving the butter layer to form an annular groove about the shoulder, hard facing the groove in the butter layer, and thereafter when some of the hard facing has come off welding further hard facing metal into the groove in the butter layer.

4,256,519

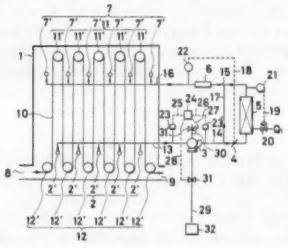
METHOD FOR HEAT TREATMENT OF LOW MELTING POINT-METAL PLATED STEEL BAND

Katsuyoshi Yoshida, Toukai; Mitsuo Higashi, Yahata; Tatsuya Kanamaru, Toukai, and Motohiro Nakayama, Chita, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 24, 1979, Ser. No. 32,882

Int. Cl.³ C21D *9/52, 9/54*

U.S. Cl. 148—156 **12 Claims**



1. A method of heat treating a low melting point-metal plated steel band for overaging said band, characterized in that a hearth roll having a surface layer which consists mainly of a phenol resin and mineral fiber is used at the overaging treatment temperature range and within a substantially non-oxidizing gaseous atmosphere such that the phenol resin substantially does not oxidize and evaporate.

4,256,520

ETCHING OF GALLIUM STAINS IN LIQUID PHASE EPITOXY

Susumu Koike, Kawachinagano; Toshio Matsuda, Ohtsu, and Hitoo Iwasa, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

Filed Dec. 20, 1979, Ser. No. 105,861

Claims priority, application Japan, Dec. 26, 1978, 53-165724

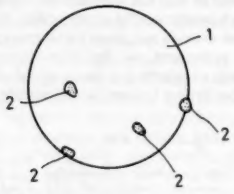
Int. Cl.³ H01L *21/208, 21/306*

U.S. Cl. 148—171 **6 Claims**

1. A method of treating semiconductor substrate comprising the step of

epitaxially growing III-V compound semiconductor layers on a substrate by a liquid phase epitaxial growth method using gallium as solvent, and then,

said substrate with said epitaxially grown layers is treated by an etchant comprising phosphoric acid, acetic acid and



nitric acid thereby selectively removing residue stains of gallium on the surface of the substrate.

4,256,521

POROUS METAL AGGLOMERATES

Rudolf Scherzinger, Johannesburg, South Africa, assignor to Metal Sales Company (Proprietary) Limited, Benoni, South Africa

Continuation-in-part of Ser. No. 891,314, Mar. 29, 1978, abandoned, which is a continuation of Ser. No. 679,461, Apr. 22, 1976, Pat. No. 4,089,715, which is a continuation of Ser. No. 494,311, Aug. 2, 1974, abandoned. This application May 16, 1979, Ser. No. 39,747

Claims priority, application South Africa, Sep. 5, 1973, 73/6092; May 29, 1978, 78/3048

Int. Cl.³ C06B *45/32*

U.S. Cl. 149—6 **9 Claims**

1. Free flowing substantially dust free porous metal fuel agglomerates comprising combustible metal powder of a size range of 0 to 500 microns, or any cut thereof, granulated with a blender of synthetic resin material by build-up to a porous agglomerate with a size range of 100 to 2500 microns having an apparent density between 0,4 to 1,1.

4,256,522

FABRICS

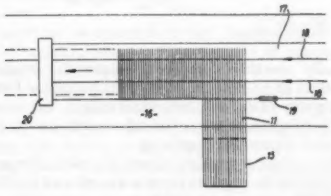
Arthur Britton, 4 The Sycamores, Bramhope, Leeds LS16 9JR, England

Filed Jun. 16, 1978, Ser. No. 916,258

Claims priority, application United Kingdom, Jun. 18, 1977, 25552/77

Int. Cl.³ B29H *9/04*

U.S. Cl. 156—178 **15 Claims**



2. Method of making a fabric in the piece comprising:

feeding a plurality of filaments through a bath of coating material that surrounds the filaments and forms filamentary material in the form of a coherent web of parallel filaments bonded together;

repeatedly and intermittently feeding forward the filamentary material in the form of a coherent web of parallel filaments bonded together;

repeatedly and intermittently indexing a carrier comprising a plurality of parallel filaments transversely across the path of said filamentary material;

severing given lengths of said filamentary material in synchronism with the intermittently indexed movements of said carrier;

placing the severed given lengths of said filamentary material side-by-side in-line on said carrier with adjacent edges of adjacent severed given lengths abutting each other; and

laminating said placed severed given lengths of said filamentary material with said carrier to produce a fabric in the piece comprising two plies of filamentary material with the filaments in one ply lying transversely to the filaments in the other ply.

4,256,523

METHOD FOR THE MANUFACTURE OF A PIPE

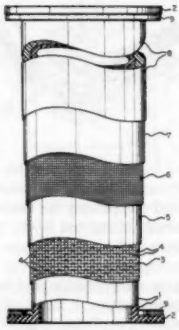
Stig O. M. Ekström, Malmö, Sweden, assignor to Handelsbolaget Evaksystem Ekstrom & Co., Malmo, Sweden

Division of Ser. No. 756,799, Jan. 4, 1977. This application Oct. 27, 1978, Ser. No. 955,227

Claims priority, application Sweden, Jan. 4, 1977, 756799

Int. Cl.³ B29D *23/00*; B29H *7/14*

U.S. Cl. 156—190 **4 Claims**



1. A method of manufacturing a pipe comprising:

placing a tubular layer of unvulcanized rubber on an expansible elongate mandrel,

wrapping on said rubber layer a layer of fabric having loops protruding therefrom with the said loops extending outwardly from said fabric layer, away from said rubber layer,

expanding said mandrel,

placing said mandrel in a heated zone to vulcanize said rubber, rotating said mandrel about its longitudinal axis while said mandrel is in said heated zone,

removing the vulcanized rubber and fabric article thus formed from said heating zone, and with said loops protruding outwardly, impregnating said fabric with an uncured thermosetting resin, wrapping said resin with at least one layer of glass fibre impregnated with uncured thermosetting resin, and

curing said resin.

4,256,524

PROCESS FOR SOLVENT BONDING BLENDED NONWOVEN FABRICS AND FABRIC PRODUCED THEREFROM

Jerry B. Hare, Durham, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 26, 1976, Ser. No. 744,920

Int. Cl.³ C09J *5/00*

U.S. Cl. 156—220 **8 Claims**

1. A process for manufacturing nonwoven fabrics having improved elongation and tear strength, comprising the steps:

forming a web from a blend of fibers selected from the group consisting of acrylic fibers, modacrylic fibers and mixtures thereof, and polyester fibers;

applying a controlled amount of a fiber solvent, said solvent being selected from the group consisting of ethylene carbonate, propylene carbonate and mixtures thereof, to the web, wherein said amount is up to about 10% of the weight of said web; and bonding contiguous fibers at their cross-over points by the application of heat and pressure so as to activate the solvent.

4,256,525

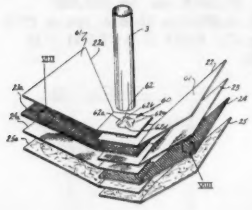
METHOD OF FORMING A FITMENT FOR A VESSEL

John D. Allen, 5005 Zahm Rd., Belding, Mich. 48809

Division of Ser. No. 901,416, May 1, 1978. This application Mar. 14, 1980, Ser. No. 130,558

Int. Cl.[3] **B32B** *1/10;* **B29C** *27/22*

U.S. Cl. 156—245 **3 Claims**



1. A method of forming a fitment for a vessel wall having filaments and a bonding matrix for binding the filaments together, said method comprising the steps of:

providing generally elongated layers of fibrous glass material; including a surfacing veil layer, a woven fabric layer and a reinforcing layer;

said layers having a top portion and leg portions;

providing a mold having a flat central portion and side portions extending at obtuse angles therefrom in opposite directions from said central portion;

assembling said layers in said mold so the top portions thereof are flat and generally aligned to form a common layer central portion within said central portion of said mold and with said layer leg portions located at the mold side portions so as to extend at obtuse angles from said layer central portion in opposite directions from each side of said layer common central portion;

forming aligned openings in the said top layer portions;

extending a pipe through said openings; and

forming a matrix of resin between and about said layers and a portion of said pipe by placing resin into the said mold thereby molding and bonding said layers to each other and to the portion of pipe adjacent said layers to form a fitment with a top wall and legs with a pipe secured to said top wall and extending between said legs.

4,256,526

METHOD FOR APPLYING A HOT MELT ADHESIVE PATTERN TO A MOVING SUBSTRATE

David C. McDaniel, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 823,268, Aug. 10, 1977, Pat. No. 4,156,398. This application Jan. 25, 1979, Ser. No. 6,561

Int. Cl.[3] **B05D** *1/02;* **B05B** *12/04;* **B05D** *5/10;* **B31B** *1/62*

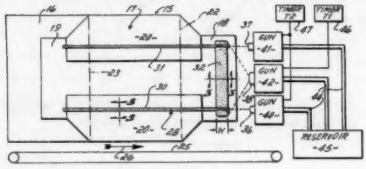
U.S. Cl. 156—295 **12 Claims**

1. In the application of a hot melt adhesive to a substrate in a pattern which includes adhesive lines that extend transversely to one another,

the method of applying said hot melt adhesive in said pattern comprising,

depositing one line of predetermined length of said hot melt adhesive from a stationary orifice onto said substrate while conveying said substrate past said orifice, said one line of adhesive extending parallel to the direction of movement of said substrate,

and, while conveying said substrate in said direction, spraying a flat sheet of said hot melt adhesive from a stationary nozzle which presents a flat spray orifice so oriented that said flat sheet extends in a plane transverse to the direction of substrate movement, said flat sheet having lateral edges which diverge angularly as a fan as said sheet moves from said flat spray orifice toward said substrate,



and terminating said spraying so quickly, in relation to the rate of substrate movement, that a transverse line of adhesive is deposited on said substrate, said transverse line having a width in the direction of substrate movement which is substantially less than its length,

said transverse line extending transversely to said one line,

said flat spray orifice being spaced from said substrate to establish a length of said transverse line which is substantially greater than the width of said flat spray orifice.

4,256,527

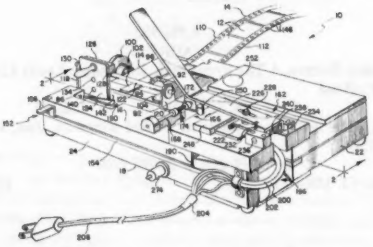
SLIDE MOUNTING APPARATUS

Lawrence E. Green, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 19, 1979, Ser. No. 95,241

Int. Cl.[3] **B32B** *31/16*

U.S. Cl. 156—443 **3 Claims**



1. Manually operable, compact apparatus for sequentially cutting sections of an elongate strip of photographic film containing a plurality of distinct, individual images, and mounting the same in individual frames for subsequent use in a slide projector, said apparatus comprising:

means for locating a stack of frames in position for an endmost frame in the stack to receive a section of an elongate strip of film containing a visible image, each of the frames including a first apertured portion adapted to receive a section of the film and a second apertured portion adapted to be moved into face-to-face relation with the first portion to thereby retain the section of film therebetween;

first means for advancing an end of the elongate strip of film onto the first portion of the endmost frame positioned at said locating means such that a section thereof containing a distinct, individual image is located in substantial alignment with the aperture in the first portion of the endmost frame;

means for cutting the section of film from the remainder of the elongate strip;

a station having an ingress and an egress, said station includ-

ing means for securing the first and second portions of the endmost frame in face-to-face relation with the apertures in each portion being located in substantial alignment with each other;

second means for advancing the endmost frame from said locating means to said station;

means, mounted intermediate said locating means and said securing means, for automatically moving the second portion of the endmost frame into face-to-face relation with the first portion as the frame is being advanced from said locating means to said station; and

third means for advancing the endmost frame from said station via said egress after the first and second portions of the frame have been secured in face-to-face relation with the section of film secured therebetween.

4,256,528

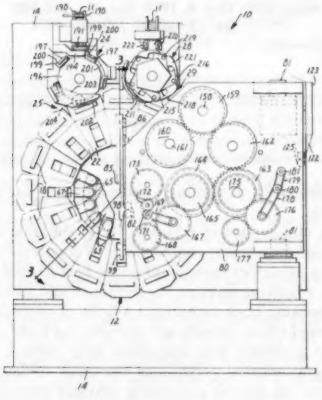
MACHINE FOR FORMING OPENINGS SEALED BY MANUALLY REMOVABLE LENGTHS OF TAPE IN CAN ENDS

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 23, 1979, Ser. No. 41,629

Int. Cl.³ B32B *31/10*

U.S. Cl. 156—514 **10 Claims**



1. In a machine comprising:

a frame;

transport means mounted on said frame adapted for releasably engaging and moving a plurality of can ends seriatim along a predetermined path;

feeding means adapted for feeding can ends seriatim to said transport means at a beginning position along said path;

opening forming means adapted for forming openings in said can ends moving along said path;

taping means mounted along said path for applying lengths of pressure sensitive adhesive tape across said openings; and

removing means for removing can ends from said transport means at an ending position along said path;

the improvement wherein:

said transport means comprises:

a wheel rotatably mounted on said frame;

a plurality of plates each mounted on said wheel for independent movement transverse of said path between a first position and a second position;

holding means on each of said plates adapted to releasably engage a can end; and

plate cam means for moving said plates to said first positions during movement of said plates along a first portion of said path, and for moving said plates to said second positions during movement of said plates along a second portion of said path;

said opening forming means are positioned to engage can ends in said plates when said plates are in their first positions; and

said taping means are positioned along said second portion of the path to engage can ends in said plates when said plates are in their second positions.

4,256,529

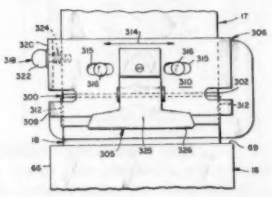
ULTRASONIC APPARATUS FOR MANUFACTURING BRASSIERE TAPES

Robert A. Clarke, White Plains; Peter J. Kuhl, Jackson Heights, and Richard H. Paschke, Medford, all of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Division of Ser. No. 826,756, Aug. 18, 1977, Pat. No. 4,158,584, which is a continuation-in-part of Ser. No. 736,756, Oct. 29, 1976, Pat. No. 4,045,271. This application Jan. 5, 1979, Ser. No. 1,083

Int. Cl.³ B29C *27/08*; B32B *31/18*

U.S. Cl. 156—515 **12 Claims**



6. Apparatus for cutting articles from an elongated continuous strip of material formed of flexible layers and having a plurality of elements spaced along said strip, and for ultrasonically welding together said layers thereof, said apparatus comprising:

A. ultrasonic welding means comprising a horn having an end surface for engaging one side of said strip, and means for vibrating said horn at an ultrasonic rate,

B. anvil means having a surface for opposing and cooperating with said horn end surface while engaging the opposite side of said strip, at least one of said surfaces having a cutting edge, said horn and said anvil means thus being adapted to cut and weld said strip simultaneously into said articles,

C. reciprocating means for effecting relative movement of said anvil means and said horn between an open position in which said anvil means and said horn are spaced apart for receiving said strip therebetween and an operative position in which said surfaces of said anvil means and horn engage said strip on opposite sides thereof, said horn at least in said operative position being ultrasonically vibrated to cut and weld said layers of said strip across the width thereof to form the trailing end of one article and the leading end of another article,

D. compliant means for resiliently mounting said anvil means, said compliant means deforming when subjected to a predetermined pressure when said surfaces of said horn and anvil means are brought into said operative position by said reciprocating means such that said cutting edge is not readily dulled by the repetitive opposition of said surfaces in said operative position,

E. clamping means for releasably securing said anvil means in abutting engagement with said compliant means such that said anvil means is free to move with any deformation of said compliant means,

F. feeding means for intermittently advancing the leading end of said strip a distance predetermined by means of said elements, said feeding means being movable between a retracted position and an extended position in timed rela-

tionship to said open position of said reciprocating means, and

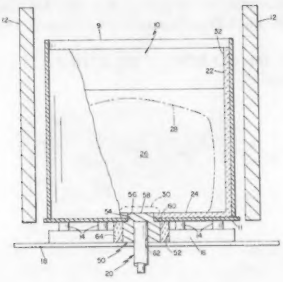
G. damping means limiting the movement of said feeding means as it reaches said extended and said retracted positions for avoiding secondary advancement of said strip and thus maintaining registration of said strip relative to said horn and said anvil means.

4,256,530

CRYSTAL GROWING

Frederick Schmid, Marblehead, and Chandra P. Khattak, Danvers, both of Mass., assignors to Crystal Systems Inc., Salem, Mass.

Filed Dec. 7, 1978, Ser. No. 967,114
Int. Cl.³ C30B *9/04, 11/00, 15/00*
U.S. Cl. 156—600 **13 Claims**



1. In the process of growing crystals in which material within a silica crucible is heated under conditions of partial vacuum to above the melting point of said material to melt the material and the material is thereafter solidified, and in which a retainer at least partially surrounds, engages and supports said crucible, that improvement comprising: providing a pressure of partial vacuum less than about 30 torr during at least part of the heating and solidification of said material; and,

providing surfaces of said crucible and said retainer in engagement with each other such that there is no direct contact between silica and elemental carbon.

4,256,531

PROCESS FOR PRODUCING SINGLE CRYSTAL OF YTTRIUM-IRON GARNET OR SOLID SOLUTION THEREOF

Shigeyuki Kimura; Isamu Shindo; Yasumichi Mori, all of Sakura; Kenji Kitamura, Tsuchiura, and Nobuo Ii, Sakura, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Feb. 10, 1978, Ser. No. 876,612
Claims priority, application Japan, Aug. 9, 1977, 52-95416; Aug. 9, 1977, 52-95417
Int. Cl.³ C30B *13/02*
U.S. Cl. 156—620 **14 Claims**

1. In a process for producing a single crystal of yttrium-iron garnet or solid solution thereof as a product by contacting a solvent with a lower edge of a calcined molded rod of a mixture of oxides for the product and with an upper edge of a seed crystal and heating the solvent part to melt it and forming a single crystal, an improvement which comprises:

using a mixture of oxides comprising yttrium oxide type component and iron oxide type component as the rod of the mixture for the product wherein a molar ratio of the yttrium oxide type component to the iron oxide type component in the rod of the mixture for the product is 2.5:5.0 to 3.5:5.0;

using a solvent comprising iron oxide type component and optionally rare earth oxide component wherein the composition of rod of the mixture for the product is different from the composition of the solvent; and

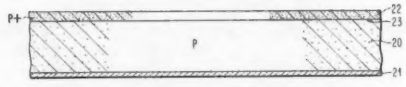
forming the single crystal by a floating zone method wherein the product rod and the seed crystal are downwardly moved at a constant speed.

4,256,532

METHOD FOR MAKING A SILICON MASK

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 812,941, Jul. 5, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,303
Int. Cl.³ B44G *1/22*
U.S. Cl. 156—628 **7 Claims**



1. A method for fabricating a self-supporting silicon mask comprising:

forming at a surface of a planar silicon substrate a silicon layer having a higher concentration of conductivity-determining impurities than the substrate beneath said layer,

forming a masking layer on the surface of said silicon layer, said masking layer comprising a layer of chemical vapor deposited silicon dioxide and an overlying layer of silicon nitride in contact with said silicon layer surface,

applying to selected portions of the other surface of said substrate an etchant comprising ethylene diamine, pyrocatechol and water which preferentially etches silicon having lower concentrations of conductivity-determining impurities to preferentially etch out the entire thickness of selected portions of said substrate to form at least one recess extending completely through said substrate to said silicon layer, each said recess having a lateral dimension in the order of 12,500 microns and said silicon remaining in said recesses having a thickness in the order of 5 microns, and

forming a pattern of apertures through said masking layer and etching said silicon layer through said apertures to form a corresponding pattern of openings through said silicon layer to at least one substrate recess.

4,256,533

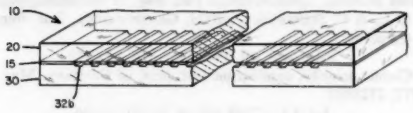
METHOD OF CONSTRUCTING LAYERED GLASS DISPLAY PANELS

William N. Mayer, White Bear Lake, Minn., assignor to Modern Controls, Inc., Elk River, Minn.

Filed Jan. 14, 1980, Ser. No. 112,103
Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—633 **11 Claims**

1. A method of constructing a gas display panel with glass plate sections, comprising the steps of;

(a) overlaying a first surface of a first glass plate section with a uniform layer of sealing glass;
(b) applying a photoresist pattern to said sealing glass layer;
(c) etching through selected portions of said sealing glass as determined by said photoresist pattern in a first etching bath;



(d) etching into said first surface of said first glass plate section a predetermined depth as determined by said photoresist pattern in a second etching bath; and
(e) compressing said first surface of said first glass plate against a surface of a second glass plate and firing same in an oven at temperature sufficiently high to melt said sealing glass layer.

4,256,534

DEVICE FABRICATION BY PLASMA ETCHING

Hyman J. Levinstein, Berkeley Heights, and David N. Wang, Warren Township, Somerset County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1978, Ser. No. 929,567
Int. Cl.³ C23F *1/00, 1/02*
U.S. Cl. 156—643 **11 Claims**

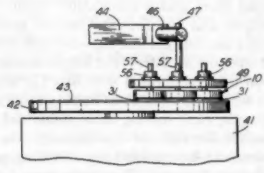
1. Process for fabrication of an article comprising at least one operation during which the article undergoing fabrication comprises a surface of material to be etched, wherein the said article is etched within a plasma environment contained within an apparatus, the plasma resulting from imposition of an electrical field across a gaseous mixture between two electrodes, the material to be etched comprising an elemental aluminum-rich composition, etching being primarily due to chemical reaction with the said material to be etched characterized in that the said gaseous mixture comprises a mixture of BCl_3 and Cl_2 which in the said plasma results in the said chemical reaction in which the Cl_2 content in the said gaseous mixture is from 0.1 volume percent to 20 volume percent expressed as a percent of the total content of BCl_3 plus Cl_2 and further in which pressure and power within the plasma environment are maintained, respectively, within the limits of from 0.05 torr to 1 torr and from 0.035 watts/cm^2 0.7 watts/cm^2.

4,256,535

METHOD OF POLISHING A SEMICONDUCTOR WAFER

Edward L. Banks, Willingboro, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 5, 1979, Ser. No. 100,622
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—645 **6 Claims**



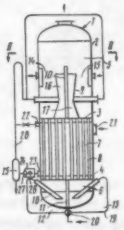
1. A method of polishing a semiconductor wafer having first and second major surfaces, comprising the steps of:
(a) placing the first major surface of the wafer on a flat non-porous substrate with a liquid interposed therebetween;
(b) polishing the second major surface of the wafer with a rotating polishing pad; and
(c) permitting free floating, rotative motion of the wafer during polishing.

4,256,536

EVAPORATOR

Vladilen M. Tyrtyshny, Grazhdansky prospekt, 105, korpus 1, kv. 58, and Albert A. Bolotov, ulitsa Nalichnaya, 45, korpus 1, kv. 43, both of Leningrad, U.S.S.R.

Filed Jun. 8, 1979, Ser. No. 46,638
Int. Cl.³ B01D *1/06*
U.S. Cl. 159—16 S **6 Claims**



1. An evaporator comprising: a shell;
upper and lower pulp chambers and a heating chamber arranged therebetween, the chambers being formed by upper and lower tube sheets mounted in the shell;
a plurality of vertical tube members for heating the liquor to be evaporated circulating therethrough, rigidly connected to said upper and lower transverse tube sheets;
a boiling chamber of the liquor to be evaporated mounted in said upper pulp chamber on the central portion of said upper transverse tube sheet;
upper and lower vertical partitions dividing said upper and lower pulp chambers and boiling chamber into twin sections, the twin sections of said upper pulp chamber being in communication with each other;
connections for feeding the liquor to be evaporated into said boiling chamber, said connections being in communication with said twin sections of said lower pulp chamber and being connected via a common pipeline to a switch of a connection for feeding a heating medium into said heating chamber;
a connection for removing non-condensable gases and a connection for removing the condensate of the spent heating medium equipped with a self-evaporator, said connections being connected via a common vapour pipeline to said twin sections of the boiling chamber;
connections for removing pulp from said twin sections of the upper pulp chamber, connected via a common pipeline to a switch; and
a connection for removing vapour from said upper pulp chamber.

4,256,537

APPARATUS FOR STRETCHING AN ENDLESS WEB

Peter P. Stanislaw, Highland Lakes, N.J., assignor to Morrison Machine Company, Paterson, N.J.

Filed Jul. 13, 1979, Ser. No. 57,201
Int. Cl.³ D21F *7/00*; D06C *3/06*
U.S. Cl. 162—273 **9 Claims**

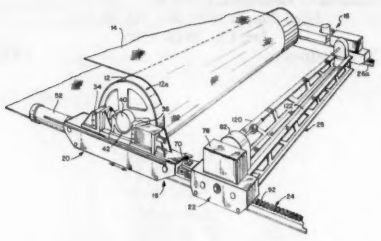
1. Apparatus for processing an endless web, comprising:
support means for supporting said endless web at a first location thereof;

a roll for supporting said endless web at a second location thereof;

track means extending between said first and second location,

movable carriage means for rotatably supporting said roll in a normal operating position and moving said roll relative to said support means along said track means;

said carriage means including a first carriage section and a second carriage section said first and second carriage section being in engagement with said track means at one end of said roll;



said first carriage section including first roll support means for lifting said one end of said roll to a position above said normal operating position independent of the location of said movable carriage means relative to said support means; and

said second carriage section including second roll support means for maintaining said roll in said lifted position without the support of said first roll support means so that said endless web may be removed from said roll.

4,256,538

LIQUID METAL COOLED FAST BREEDER NUCLEAR REACTOR

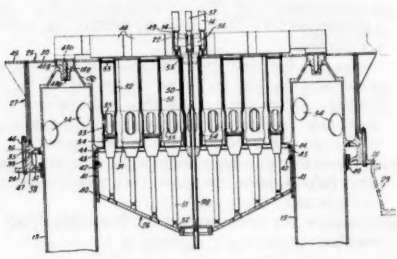
Donald Scott, Hartford, England, assignor to Nuclear Power Company Limited, England

Filed Dec. 26, 1978, Ser. No. 972,866

Claims priority, application United Kingdom, Jan. 16, 1978, 1659/78

Int. Cl.³ G21C *15/00*

U.S. Cl. 176—40 **6 Claims**



1. In a liquid metal cooled fast breeder nuclear reactor of the kind wherein a fuel assembly is submerged in a pool of coolant and a short upright generally cylindrical plenum is disposed below the fuel assembly for distributing coolant flow therethrough, a fuel assembly support structure comprising an undershell disposed below the plenum to envelop the lower face thereof and a shroud member loosely embracing the periphery of the plenum, the combination of plenum, undershell and shroud member being supported at a peripheral flange of the undershell, and a plurality of strut members extending through said plenum to said undershell for distributing the load of the fuel assembly over the undershell.

4,256,539

METHOD OF GENERATING GAS AND COKE DUST BY RAPID DEGASIFICATION AND RAPID VAPORIZATION

Ernst Schuster, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersback, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 894,858

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721997

Int. Cl.³ C10B *49/16, 57/00, 49/20*

U.S. Cl. 201—9 **5 Claims**

1. A method of generating gas and coke dust from coal dust with simultaneous desulfurization of coal dust, the method comprising the steps of:

vaporising one portion of the coal dust by rapidly heating said portion of coal dust to a vaporization temperature and converting the coal dust to a mixture of gaseous and solid products including coke dust,

degasifying and desulfurizing a second portion of the coal dust by directly transferring heat from the gaseous and solid products of said vaporizing step to a second portion of the coal dust by conveying the products to the second portion of the coal dust for heating the second portion to a temperature less than the vaporization temperature but sufficiently high for degasifying and desulfurizing the second portion and converting the second portion to produce gas and coke dust.

4,256,540

REGENERATIVE HEATING SYSTEM FOR HORIZONTAL COKE OVEN BATTERIES

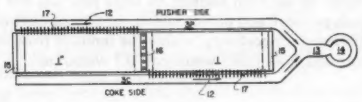
Manfred Strobel, and Friedrich Thiersch, both of Recklinghausen, Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Continuation of Ser. No. 853,817, Nov. 21, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,612

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654555

Int. Cl.³ C10B *5/02, 21/14*

U.S. Cl. 202—139 **2 Claims**



1. In a coke oven construction, comprising a coke oven battery having a pusher side on one side thereof and a coke side on the opposite side thereof, a first heating gas flue containing high temperature heating gas disposed along said pusher side, and a second heating gas flue containing high temperature heating gas disposed along said coke side, a stack flue adjacent one side of said coke oven battery connected to each of said first and second flues, and a connection means between said coke oven battery and said first and second heating gas flues for establishing a heating gas flue between said first and second flues and said coke oven battery; the improvement comprising, said coke oven battery divided into first (**1**) and second (**1'**) longitudinally separated coke oven battery sections of substantially equal length, each having said pusher side on one side thereof and said coke side on the opposite side thereof, said connecting means (**4,4a**) establishing a heating gas flow from one of said first and second flues into one of said first and second sections in a downward direction on one of said pusher side and said coke side and a heating gas flow from the other of said first and second sections in an upward direction on the other of said pusher side and said coke side, a center head (**16**)

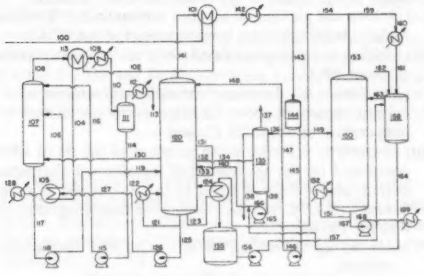
disposed between said first and second coke oven battery sections, the cross-sectional area of said first heating gas flue (3P) being approximately equal to that of said second heating gas flue (3C) in the area adjacent said stack flue (13), the cross-sectional area of said stack flue (13) being approximately equal to the sum of the cross-sectional areas of said first and second heating gas flues.

4,256,541

PRODUCTION OF ANYDROUS ALCOHOL

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed May 29, 1979, Ser. No. 43,189
Int. Cl.³ C07C *29/26, 31/08*
U.S. Cl. 203—19 **8 Claims**



1. A process for obtaining anhydrous ethanol from a dilute aqueous ethanol feed containing one or more low boiling impurities in an amount which would perceptibly interfere with the proper operation of a decanter employing a heads stripping column for removal of at least as much of the low boiling impurities in the ethanol feed as is necessary to provide proper operation of the decanter, a rectifying column for concentrating the ethanol, an anhydrous column for drying the ethanol substantially to completeness using an azeotrope-forming agent, and a decanter for separating an upper phase rich in azeotrope-forming agent from a lower phase made up largely of water, which comprises:

(a) providing means for obtaining said anhydrous ethanol consisting essentially of said heads stripping column, said rectifying column and said anhydrous column;

(b) stripping the dilute ethanol feed in the heads stripping column operated with thermal values contained in side-stream vapor withdrawn from the rectifying column;

(c) concentrating the stripped dilute ethanol feed in the rectifying column; and,

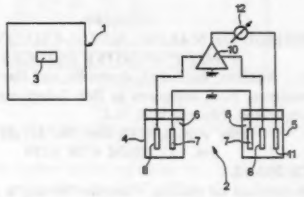
(d) azeotropically distilling the concentrated ethanol in the anhydrous column operated under substantially superatmospheric pressure to provide substantially anhydrous ethanol with thermal values recovered from the anhydrous column overhead being used to satisfy part or all of the thermal operating requirements of the rectifying column.

4,256,542

PROCESS AND DEVICE FOR MONITORING THE CHANGE IN THE SURFACE CONDITION OF A METAL COMPONENT IN AN INSTALLATION CONTAINING AN IONIC PHASE

Daniel Tytgat, Brussels; Albert Degols, Berg, and Francois Dujardin, Brussels, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Apr. 30, 1979, Ser. No. 34,680
Claims priority, application France, May 5, 1978, 78 13602
Int. Cl.³ G01N *27/46, 27/30*
U.S. Cl. 204—1 T **14 Claims**



1. Process for monitoring or predicting a change in the surface condition of a metal component in contact with an ionic phase in an installation which comprises:

providing a control cell comprising a work electrode of the same metal as said meta component, a reference electrode and an electrolyte reproducing said ionic phase of said installation, actual working conditions prevailing in said control cell,

providing a comparison cell comprising a work electrode, a reference electrode and an electrolyte and maintaining standard working conditions in said comparison cell,

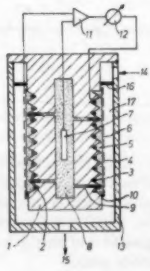
applying the equilibrium voltage of said control cell, to said comparison cell so as to oppose the voltage of said comparison cell and measuring the resultant current, if any, through said comparison cell.

4,256,543

ELECTROCHEMICAL DETECTION OF PHOSGENE IN GAS MIXTURES

Otto Petersen, and Hans-Dieter Schmidt, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 804,696, Jun. 8, 1977, Pat. No. 4,200,512.
This application Jul. 9, 1979, Ser. No. 55,571
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627487
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—1 T **8 Claims**



1. In a process for the polarographic measurement of phosgene in a gas mixture wherein the improvement comprises providing a polarographic cell containing at least two electrodes and an electrolyte in the cell containing formamide;

reacting phosgene in a gas mixture with the formamide to produce a reaction product including HCN; and polarographically measuring the HCN to obtain a current which is proportional to the concentration of phosgene and is unaffected by the other gases in the gas mixture.

4,256,544

METHOD OF MAKING METAL-CHALCOGENIDE PHOTOSENSITIVE DEVICES

Maria S. Kazacos, Earlwood, Australia, and Barry Miller, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1980, Ser. No. 137,317
Int. Cl.³ H01M *4/04, 6/36*
U.S. Cl. 204—2.1 **10 Claims**

1. A method of making a device having a photosensitive metal selenide film comprising the steps of:

forming a selenium and metal containing aqueous solution; and

cathodically depositing the metal selenide on a conductive substrate in said solution

characterized in that

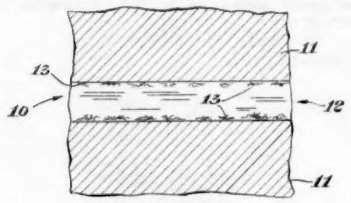
said selenium containing solution comprises an aqueous solution of $SeSO_3^{-2}$.

4,256,545

METHOD OF OXYGEN ELECTRODE PREPARATION AND PRODUCT THEREOF

Gary A. Deborski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1978, Ser. No. 939,599
Int. Cl.³ C25B *11/16;* **B65D** *85/00;* **H01M** *4/88;* **B01J** *23/84*
U.S. Cl. 204—290 R **11 Claims**



1. Method of providing an electrocatalytically active manganese oxide deposit on the interior pore wall surfaces of a porous metallic electrode body comprising:

applying a stable, liquid, pyrolyzable, inorganic permanganate salt reagent to and on the interior pore walls of the metallic electrode body;

the heating the reagent-bearing electrode in a gaseous oxidizing atmosphere to a temperature of from about 250° C. to about 700° C. until the reagent decomposes to manganese oxide(s) layer deposit formations on said pore walls.

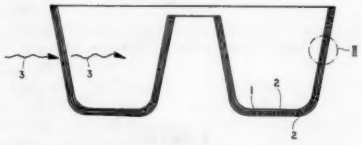
9. The electrode produced from the method of claims 1 or 2.

4,256,546

METHOD OF MAKING A BAKING FORM FOR IMPROVED BROWNING OF BAKED GOODS

Robert Brugger, Filderstadt, Fed. Rep. of Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Fed. Rep. of Germany

Division of Ser. No. 925,746, Jul. 18, 1978, Pat. No. 4,177,438. This application Jul. 25, 1979, Ser. No. 60,347
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732668
Int. Cl.³ C25D *11/08, 11/16, 11/20*
U.S. Cl. 204—33 **1 Claim**



1. A method of making a baking form for browning baked goods and of improving the browning capabilities of a baking form drawn from sheet aluminum comprising anodically forming aluminum oxide coatings along internal and external surfaces of the drawn aluminum sheet; and electrolytically coloring said coatings in the presence of a tin or a silver compound to incorporate tin or silver into said coatings, the drawn aluminum sheet being subjected in succession to the steps of

(a) etching and pickling in aqueous substantially 9% sodium hydroxide solution at a temperature of about 65° C.,

(b) pickling in semiconcentrated nitric acid at a temperature of about 20° C.,

(c) anodization by direct-current sulfuric treatment with a current density of about 1.5 amperes per decimeter^2 at a temperature of about 20° C., and

(d) electrolytic coloring in the presence of the tin or silver compound by the application of transformed alternating current at a voltage of about 15 to 20 volts and at a temperature of 22° C. in a bath having the following composition for 100 liters:

about 6.5 kg tin sulfate, silver nitrate or a combination thereof,

about 6.0 kg polyglycol,

about 10.0 kg of 65% phenylsulfonic acid,

about 10 kg concentrated sulfuric acid,

about 2.0 kg tartaric acid, and

about 0.5 kg aluminum sulfate.

4,256,547

UNIVERSAL CHROMIC ACID ANODIZING METHOD

Earl W. Turns; Robert E. Forrester, Jr., and Arthur C. Porter, all of Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Jul. 12, 1979, Ser. No. 57,058
Int. Cl.³ C25D *11/08, 11/18*
U.S. Cl. 204—35 N **7 Claims**

1. In a method of anodizing aluminum alloy parts that include the steps of:

a. connecting the aluminum alloy parts as an anode of a direct current voltage source that is positive with respect to a cathode and has a differential voltage existing between said anode and said cathode;

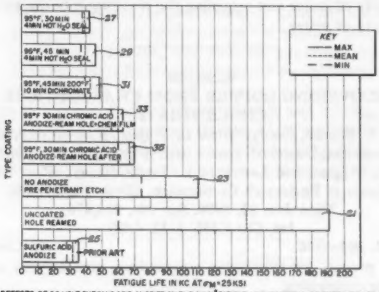
b. immersing said aluminum part connected as said anode and said cathode in an electrolyte comprising an aqueous solution of chromic acid;

c. carrying out the anodizing for a predetermined time; and

d. removing the anodized aluminum part from said electrolyte and said connection with said anode; the improvement comprising a standardized anodizing procedure that will be effective to meet predetermined specifications regarding salt spray corrosion resistance, fatigue failure

resistance, paint adhesion, and coating weights, regardless of the type of aluminum alloy being employed, including alloys containing at least five percent (5%) copper and at least seven and one-half percent (7.5%) total alloying elements, comprising the steps of:

e. imposing as said differential voltage a direct current electromotive potential in the range of 15–25 volts between said anode and said cathode;



EFFECTS OF 20 VOLT CHROMIC ACID ANODIZE ON THE AXIAL* FATIGUE LIFE OF 7475-T73511 ALUMINUM PLATE, R=0.1
*TENSION-TENSION

f. maintaining a temperature of said electrolyte and said aluminum part in the range of 90° F.–105° F.;

g. continuing said anodizing for a period in the range of 20–60 minutes;

such that a single process enables anodizing substantially any aluminum alloy parts in a plant making fabricated aluminum parts and the like and obtain anodizing to meet said predetermined specifications without having to have a plurality of processes for a plurality of different types of aluminum alloy.

4,256,548

ELIMINATION OF ANODE HYDROGEN CYANIDE FORMATION IN TRIVALENT CHROMIUM PLATING

Donald J. Barclay, and James M. L. Vigar, both of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1979, Ser. No. 86,091

Claims priority, application United Kingdom, Nov. 11, 1978, 44178/78

Int. Cl.³ C25D *3/06, 3/56*

U.S. Cl. 204—43 R **17 Claims**

1. A chromium or chromium alloy electroplating solution in which the source of chromium comprises an aqueous solution of a chromium (III)-thiocyanate complex and which is susceptible to evolution of hydrogen cyanide as a result of the oxidation of thiocyanate anions to free thiocyanogen at the anode characterized in that the solution further comprises an additive which will undergo electrochemically reversible oxidation at the anode in preference to the thiocyanate oxidation.

4,256,549

HYBRID PROCESS FOR PRODUCING HYDROGEN

Jiri Divisek, and Jürgen Mergel, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 119,107

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904923

Int. Cl.³ C25B *1/02*

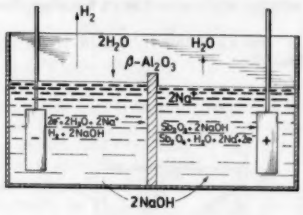
U.S. Cl. 204—60 **8 Claims**

1. A method of producing hydrogen by a hybrid process, including the steps of:

providing a molten salt or fusion electrolyte containing water;

introducing into said electrolyte a low antimony oxide formed at a high temperature from a higher antimony oxide accompanied by splitting-off of oxygen;

anodically oxidizing said low antimony oxide in a melt-flow electrolysis, along with simultaneous cathodic generation



of hydrogen, to again form said higher antimony oxide; and

returning said higher antimony oxide to a high temperature region of approximately 850°–1000° C. to decompose same into said low antimony oxide and oxygen.

4,256,550

METHOD FOR PRODUCING VITAMIN B_1 AND ITS INTERMEDIATE

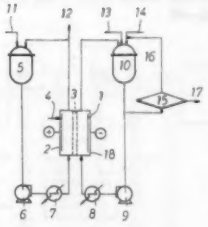
Takao Niinobe, 2209-5, Aza-Kamomukai, Oaza-Mii, Hikari; Kokichi Yoshida, 2839-1, Oaza-Murozumimura, Hikari, and Masao Yokoyama, 14-10, Nijigaoka 4-chome, Hikari, all of Japan (743)

Filed Nov. 26, 1979, Ser. No. 97,341

Claims priority, application Japan, Dec. 1, 1978, 53/149419

Int. Cl.³ G25B *3/02; C25B 3/04*

U.S. Cl. 204—72 **5 Claims**

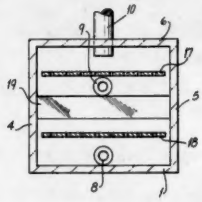


1. An electrolytic method for simultaneously producing vitamin B_1 and 2-methyl-4-amino-5-aminomethylpyrimidine which comprises providing an electrolysis cell separating the anode side of said cell from the cathode side by at least one sheet of cation-exchange membrane, and oxidizing electrochemically N-[2'-methyl-4'-aminopyrimidyl-5'-]methyl-4-methyl-5-β-hydroxyethyl-thiothiazolone(2) in an acidic solution in the anode side with the surface potential of the anode being maintained at not higher than the oxygen-generating potential so as to allow vitamine B_1 to be produced, while reducing electrochemically, at the same time, 2-methyl-4-amino-5-cyanopyrimidine in an acidic solution in the cathode side to allow 2-methyl-4-amino-5-aminomethylpyrimidine to be produced.

4,256,551
ELECTROLYTIC PROCESS

Michael J. Cliff, Elton near Chester; William T. Cross, Cuddington, and Colin Ramshaw, Norley, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 23, 1979, Ser. No. 87,569
Claims priority, application United Kingdom, Nov. 2, 1978, 42888/78
Int. Cl.[3] C25B 1/14, 1/26, 11/03
U.S. Cl. 204—98 15 Claims

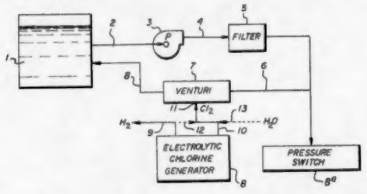


1. A process for electrolysing at least a proportion of a liquid comprising an electrolyte which process comprises passing the liquid between electrodes, at least one of which is an anode and at least one of which is a cathode, the liquid being in a state of laminar flow substantially parallel to the electrodes, the electrodes being disposed substantially horizontally above each other and each electrode being permeable to the product(s) or solutions thereof produced at or adjacent the electrode and, where a density difference is generated on production of the products, the relative disposition of the electrodes is such that the density difference in combination with laminar flow of the liquid reduces the possibility of the product(s) produced at or adjacent the anode mixing with the product(s) produced at or adjacent the cathode.

4,256,552
CHLORINE GENERATOR

Charles T. Sweeney, 448 Earle Rd., Hewitt, Tex. 76643

Filed Nov. 8, 1979, Ser. No. 92,645
Int. Cl.[3] C25B 1/16, 1/00, 9/00; C02F 1/76
U.S. Cl. 204—98 17 Claims



17. A method for chlorinating a body of water which comprises

providing a chlorine generator comprising a hollow container having a wall dividing the same into two compartments and including an ion-permeable membrane permitting flow of cations therethrough,

a cathode in one of said compartments,

an anode in the other of said compartments,

a bipolar electrode in said other compartment positioned between said anode and said membrane,

said bipolar electrode being of a size and shape permitting free circulation of electrolyte therearound and being exposed on all sides to the same aqueous electrolyte,

providing water to said cathode compartment,

providing a water solution of sodium chloride to said anode compartment to surround said anode and said bipolar electrode,

passing a predetermined amount of direct current through said water and said sodium chloride solution to produce chlorine at said anode and said bipolar electrode and to produce hydrogen and sodium hydroxide at said cathode,

collecting said chlorine, and

mixing said chlorine at a predetermined rate with part of said body of water and returning the resulting mixture to said body of water.

4,256,553
RECOVERING COPPER FROM CHALCOPYRITE CONCENTRATE

Frank A. Baczek, Sandy; Bruce C. Wojcik, Kearns; Alexander A. Jueschke; Daniel M. Lewis, both of Salt Lake City; Jack C. Otto, Magna, and Lawrence L. Tuttle, Sandy, all of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 23, 1980, Ser. No. 114,476
Int. Cl.[3] C25C 1/12, 7/00
U.S. Cl. 204—106 26 Claims

1. A process for recovering copper from chalcopyrite concentrate comprising:

a. grinding said chalcopyrite concentrate to a mean particle size diameter of about 1.5–5 microns;

b. dividing said ground chalcopyrite concentrate into a first stream and a second stream;

c. leaching said first stream in a leach solution containing at least about 100 gpl sulfuric acid and about 10–30 gpl ferric iron to produce a copper sulfate solution containing about 40–75 gpl dissolved copper and less than about 5 gpl ferric iron;

d. combining said second stream with said copper sulfate solution and with sulfur dioxide such that said combination reacts to precipitate said dissolved copper from said solution as simple copper sulfides and to produce a liquor containing dissolved ferrous iron;

e. separating said simple copper sulfides from said ferrous iron liquor;

f. adding sulfuric acid to said ferrous iron liquor to precipitate said ferrous iron as ferrous sulfate and to produce a recycle solution containing about 400–600 gpl sulfuric acid;

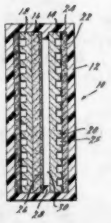
g. adding said recycle solution to said leach solution of step (c) above; and

h. recovering copper from said simple copper sulfides.

4,256,554
ELECTROLYTIC CELL FOR SEPARATING CHLORINE GAS FROM OTHER GASES

Harry K. Bjorkman, Jr., Birmingham, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Mar. 28, 1980, Ser. No. 134,929
Int. Cl.[3] C25B 1/26, 9/00
U.S. Cl. 204—128 21 Claims



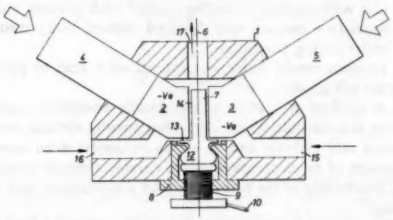
1. An electrolytic cell for separating foreign gases from a stream of chlorine and foreign gases, comprising:

(a) cathode means for reducing chlorine gas into chloride ions;
(b) anode means for oxidizing chloride ions into chlorine gas;
(c) membrane means for permitting ionic and liquid transfer and preventing gas transfer between said cathode and anode means;
(d) a housing for aligning said cathode means, said membrane means, and said anode means, and including inlet means for receiving said stream of chlorine and foreign gases, foreign gas outlet means for venting said foreign gases from said cell, and chlorine gas outlet means for venting said chlorine gas generated by said anode means from said cell;
(e) an aqueous electrolyte contained in said housing; and
(f) electrical power means for providing a potential difference across said anode and cathode means sufficient to cause said chlorine gas reduction and chloride ion oxidation.

4,256,555
ELECTRO-CHEMICAL-MACHINING OF AEROFOIL BLADES

John F. Wilson, and Brian Towler, both of Bristol, England, assignors to Rolls Royce Limited, London, England

Filed May 22, 1979, Ser. No. 41,396
Claims priority, application United Kingdom, May 30, 1978, 24414/78
Int. Cl.³ B23P *1/02, 1/14, 1/16*
U.S. Cl. 204—129.5 **13 Claims**



7. A method of producing an article by electro-chemically machining a workpiece, the method comprising the steps of:
supporting the workpiece for machining;
locating a plurality of electrodes of an electrode assembly adjacent to the workpiece, each electrode being movable in a first direction relatively towards the workpiece, and each electrode comprising a main body having a machining face shaped to a desired contour and two side members carried by the main body, the side members being constrained to move with the body and also relative to the body in a direction parallel with the first direction of movement of the electrodes, the side members protruding ahead of the machining face of the main body;
maintaining a gap between the electrodes and the workpiece;
supplying electrolyte to the gap between the electrodes and the workpiece;
applying an electrical potential between the electrodes and the workpiece thereby to electro-chemically machine the workpiece;
causing mutual relative approaching movement between the electrodes and the workpiece to machine the workpiece;
and stopping the relative approaching movement of the side members while continuing the approaching movement of the main body of the electrodes.

4,256,556
ANODICALLY POLARIZED SURFACE FOR BIOFOULING AND SCALE CONTROL

John E. Bennett, and Joseph E. Elliott, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

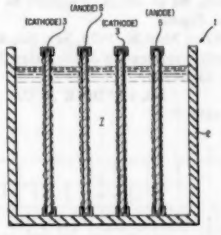
Filed Nov. 24, 1978, Ser. No. 963,611
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—147 **9 Claims**

1. A method of maintaining an electrocatalytic electroconductive surface free of deposits in an aqueous environment containing chloride ion selected from the group consisting of biological and hardness deposits in an aqueous environment, said electrocatalytic, electroconductive surface being such as to be capable of generating an effective amount of oxygen to maintain said surface free of biological and hardness deposits with substantially no evolution of chlorine gas when made anodic, comprising: making said surface anodic so as to electrolyze the water in contact therewith to produce sufficient oxygen and hydrogen ion at said anodic surface to prevent formation of biological or hardness deposits without the evolution of any chlorine.

4,256,557
COPPER ELECTROWINNING AND CR^{+6} REDUCTION IN SPENT ETCHANTS USING POROUS FIXED BED COKE ELECTRODES

David M. Soboroff, Rockville, Md., and Hector O. McDonald, Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 16, 1979, Ser. No. 85,449
Int. Cl.³ C25C *1/12, 7/02;* **C02C** *5/12*
U.S. Cl. 204—149 **9 Claims**



1. A method of reducing Cr^{+6} to Cr^{+3} and recovering copper values from spent chromium oxidizing solutions, comprising:
placing an exhausted Cr^{+6} etching or oxidizing solution containing copper ions and Cr^{+3} ions in an electrolytic cell containing at least one pair of carbon particle electrodes as the cathode and anode respectively; and
forcefully flowing said exhausted solution through the electrodes and simultaneously impressing a direct current across said electrodes such that at the cathode divalent copper is reduced to copper metal and Cr^{+6} values are reduced to trivalent chromium and at the anode water is oxidized to oxygen.

4,256,558

CURED OR UNCURED LINEAR AROMATIC POLYESTER COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Hiroo Inata; Tamio Arakawa, and Toshio Nishihara, all of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 7, 1977, Ser. No. 840,301

Claims priority, application Japan, Oct. 12, 1976, 51/121322; Mar. 17, 1977, 52/028026; Mar. 23, 1977, 52/031121

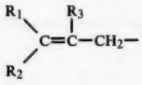
Int. Cl.³ B29B *3/02*; C08F *8/00*

U.S. Cl. 204—159.15 **11 Claims**

1. A process for preparing a cured linear aromatic polyester composition, which comprises extruding under melting conditions, an uncured linear aromatic polyester composition comprising

(A) 100 parts by weight of a saturated linear aromatic polyester in which at least 70 mole % of the acid component consists of terephthalic acid and the glycol component is ethylene glycol, and

(B) 0.1 to 50 parts by weight of a polyallyl compound which contains not less than 2 allyl or substituted allyl groups in the molecule, does not decompose under conditions of melt-blending with the polyester (A), and is non-reactive with the polyester (A) under conditions of melt-blending with the polyester (A), the allyl or substituted allyl groups being expressed by the following formula



wherein R_1, R_2 and R_3 are identical to or different from each other and represent a member selected from the group consisting of a hydrogen atoms and organic groups;

and subjecting the resulting extrudate to a curing treatment by the application of ultraviolet irradiation in the presence of a photo-reaction initiator.

11. A cured linear aromatic polyester composition obtained by the process of claim 1.

4,256,559

METHOD AND APPARATUS FOR REGENERATING SPENT PHOTOGRAPHIC BLEACH-FIXER SOLUTION

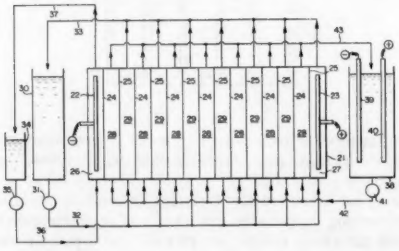
Takezo Ono, Takatsuki; Mineo Watanabe, Ibaraki, and Seiki Iribe, Mihara, all of Japan, assignors to Teijin Engineering Ltd., Tokyo, Japan

Filed May 30, 1979, Ser. No. 43,641

Claims priority, application Japan, May 31, 1978, 53/64377; Jul. 18, 1978, 53/86789

Int. Cl.³ B01K *13/02*

U.S. Cl. 204—180 P **6 Claims**



1. A method for regenerating a spent photographic bleach-fixer solution containing silver complex ions, silver ions, halogen ions and ferrous complex salt, which comprises

subjecting said bleach-fixer solution to electrodialysis across ion exchange membranes to transfer said silver complex ions, silver ions and halogen ions from said bleach-fixer solution, through said ion exchange membranes, to an aqueous solution capable of dissolving silver salts, said ferrous complex salt being substantially completely retained in said bleach-fixer solution,

subjecting the resultant aqueous solution containing silver complex ions, silver ions and halogen ions to electrolysis to electrodeposit metallic silver, and

subjecting the resultant bleach-fixer solution to anodic oxidation to convert said retained ferrous complex salt to ferric complex salt.

4,256,560

CURABLE RESINOUS COMPOSITIONS USEFUL IN COATING APPLICATIONS

Stephen L. Buchwalter, Allison Park; Robert D. Jerabek, Glenshaw, both of Pa.; Lee-Pei H. Chou, Hudson, Ohio, and Roger M. Christenson, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 937,368, Aug. 28, 1978, Pat. No. 4,198,331. This application Sep. 19, 1979, Ser. No. 77,248

Int. Cl.³ C25D *13/06*; C08L *63/10*

U.S. Cl. 204—181 C **8 Claims**

1. A method of coating an electrically conductive surface serving as a cathode which comprises passing electric current between said cathode and an anode immersed in an aqueous dispersion of an electrodepositable curable resinous composition, comprising as the resinous binder:

(A) a polyamine resin containing primary and/or secondary amino groups, said polyamine resin being stable under curing conditions; and

(B) a Michael adduct of an organic material containing alpha, beta-ethylenically unsaturated moieties in conjugation with carbonyl moieties reacted with primary and/or secondary amines, said Michael adduct being unstable under curing conditions;

said resinous binder being neutralized with acid to provide cationic salt groups.

8. A method of coating an electrically conductive surface serving as a cathode which comprises passing electric current between said cathode and an anode immersed in an aqueous dispersion of an electrodepositable curable resinous composition, comprising as the resinous binder a polyamine resin containing:

(A) primary and/or secondary amino groups which are non-volatile under curing conditions; and

(B) amine groups which are formed by reacting alpha, beta-ethylenically unsaturated moieties in conjugation with carbonyl moieties with primary and/or secondary amines which are volatile under curing conditions;

said polyamine resin being neutralized with acid to provide cationic salt groups.

4,256,561

ELECTROCHEMICAL MEASURING ELECTRODE

Johannes G. Schindler, Marburg, and Wilfried Schal, Bad Homburg, both of Fed. Rep. of Germany, assignors to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed May 8, 1979, Ser. No. 37,232

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820474

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—195 M **9 Claims**

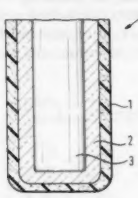
1. An electrochemical measuring electrode comprising:

(a) an electrically conductive contact;

(b) an ion selectively active organic polymer membrane covering said contact; and

(c) at least one solid ion conducting diffusion barrier com-

prising a solid body having a high diffusion resistance to oxygen selected from the group consisting of a vitreous



material, a dental cement, and a fused layer of salt, disposed between said membrane and said contact.

4,256,562

UNITARY FILTER PRESS CELL CIRCUIT

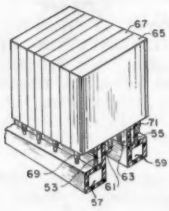
Luciano Mose, Dortmund; Helmut Schurig, Holzwickede, and Bernd Strasser, Hamm, all of Fed. Rep. of Germany, assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 17, 1979, Ser. No. 40,018

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821985

Int. Cl.³ C25B *15/08, 9/00*

U.S. Cl. 204—258 **8 Claims**



1. In a filter press type electrolytic cell comprising a plurality of electrolytic cell units with separators forming anolyte and catholyte compartments, said compartments housing vertically mounted planar electrode elements wherein the cell units are mounted on a rigid, non-hollow longitudinal support the improvement comprising, the cell units mounted atop a support structure consisting of a combination of both electrolyte inlet conduits and electrolysis product outlet conduits, said support structure being exterior to and non-integral with the cell units, but directly connected by individual conduit means to individual anolyte and catholyte compartments of said cell units.

4,256,563

ELECTRODE FOR ELECTROCHEMICAL PROCESSES AND PRODUCTION METHOD THEREFOR

Vladimir L. Kubasov, ulitsa Kirovogradskaya, 4, korpus 2, kv. 135; Leonid I. Jurkov, ulitsa Tashkentskaya, 22, korpus 1, kv. 124; Vladimir B. Busse-Machukas, Izmailovsky bulvar, 37, kv. 27; Georgy N. Kokhanov, ulitsa Melnikova, 23, kv. 29, and Florenty I. Lvovich, 1 Nizhne-Mikhailovsky proezd, 16, kv. 55, all of Moscow, U.S.S.R.

Filed Jan. 3, 1980, Ser. No. 109,299

Int. Cl.³ C25B *11/06, 11/10*

U.S. Cl. 204—290 F **5 Claims**

1. An electrode for electrochemical processes comprising an electrically conductive base topped with a layer of active compound composed of, wt %:

metal oxide from the platium group	5–45
at least one metal oxide from the iron and manganese group	19–94.9
boron oxide	0.1–50

4,256,564

CRACKING PROCESS AND CATALYST FOR SAME CONTAINING INDIUM TO PASSIVATE CONTAMINATING METALS

John S. Roberts; Brent J. Bertus, and Dwight L. McKay, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 3, 1979, Ser. No. 26,504

Int. Cl.³ C10G *11/05, 9/16, 37/14*

U.S. Cl. 208—120 **17 Claims**

1. In the process for the catalytic cracking of a hydrocarbon feedstock containing at least one catalyst contaminating metal selected from the group consisting of nickel, vanadium, iron, copper, and cobalt, the improvement comprising employing a modified cracking catalyst produced by combining a zeolite containing cracking catalyst with at least one modifier selected from the group consisting of elemental indium and indium compounds free of the element antimony, said at least one modifier being combined with said cracking catalyst in an amount sufficient to reduce the deleterious effects of said contaminating metals.

4,256,565

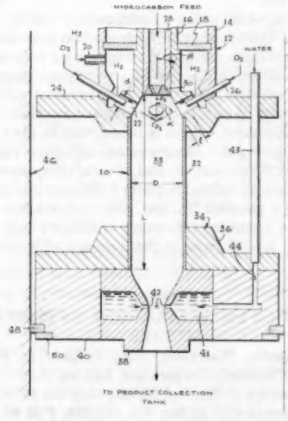
METHOD OF PRODUCING OLEFINS FROM HYDROCARBONS

Joseph Friedman, Encino; William S. Hines, Thousand Oaks; Frederick D. Raniere, Northridge, and Jacob Silverman, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 13, 1979, Ser. No. 93,423

Int. Cl.³ C10G *9/36*

U.S. Cl. 208—129 **11 Claims**



1. A method for producing high yields of olefins from a hydrocarbon feedstock comprising:

(a) providing a hydrocarbon at a temperature above its melting point but below the temperature at which any substantial coke or tar forms;

(b) providing first and second reaction zones immediately adjacent to and in flow communication with one another;

(c) introducing a stream of gaseous oxygen into a central portion of said first reaction zone;

(d) introducing a cocurrent flow of hydrogen or hydrogen-containing gas about the periphery of said gaseous oxygen stream in said first reaction zone, reacting said hydrogen and oxygen with one another, said hydrogen and oxygen being introduced in amounts to provide a gas stream of reaction products having an average temperature within the range of from 1,000° to 2,000° C., and which comprise a major amount of hydrogen and a minor amount of water vapor;

(e) cocurrently introducing the gas stream from said first reaction zone and a finely dispersed spray of said hydrocarbon into said second reaction zone, said spray comprising droplets having a median diameter of less than about 100 microns and said spray being introduced into said reaction zone to impinge upon the gas stream at an included half angle of from 25° to 45°, said gas stream being introduced at a velocity at least four times greater than that of said hydrocarbon and said hydrocarbon and gas being introduced in amounts to provide a heating rate in excess of 200,000° C./sec. to produce in time of less than about 2 milliseconds a flowing reaction mixture having a temperature within the range of from 800° to 1,800° C.;

(f) maintaining said flowing reaction mixture at said temperature for a time of from about 1 to 10 milliseconds to form enhanced yields of olefins;

(g) quenching said reaction mixture to a temperature of less than about 600° C. in a time of less than about 2 milliseconds to rapidly arrest said reaction; and

(h) recovering the olefins formed.

4,256,566

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Aug. 20, 1979, Ser. No. 68,278

The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.

Int. Cl.[3] **C10G** *35/08*

U.S. Cl. 208—139 **21 Claims**

1. A process for converting a hydrocarbon which comprises contacting said hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation and pyrolysis of said rhenium carbonyl component, and of a tin component.

19. The process as defined in claim **1** wherein said hydrocarbon comprises a gasoline fraction, said hydrocarbon conversion conditions comprise reforming conditions and wherein said contacting is performed in the presence of hydrogen.

4,256,567

TREATMENT OF PETROLEUM STOCKS CONTAINING METALS

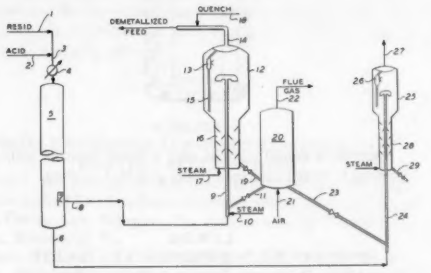
David B. Bartholic, Watchung, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 38,928, May 14, 1979, which is a continuation-in-part of Ser. No. 875,326, Feb. 6, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,227

Int. Cl.[3] **C10G** *53/10, 53/08*

U.S. Cl. 208—252 **8 Claims**

1. A process for upgrading a petroleum charge which contains high boiling components of substantial metal content and Conradson Carbon number which comprises mixing said charge with a sulfonating agent, separating the resultant mixture to provide a major raffinate fraction and a minor extract fraction and contacting one of said fractions in a confined rising vertical column with an inert solid material having a microactivity for catalytic cracking not substantially greater than 20 at low severity, including a temperature of at least about 900° F. for a period of time less than 2 seconds and less than that which induces substantial thermal cracking of said



fraction, at the end of said period of time separating from said inert solid a decarbonized hydrocarbon product of reduced Conradson Carbon number as compared with said fraction and reducing temperature of said separated product to a level below that at which substantial thermal cracking takes place to terminate said period of time.

4,256,568

REMOVAL OF PHENOLS FROM PHENOL-CONTAINING STREAMS

Richard H. Schlosberg, New Providence, and Charles G. Scouten, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 19, 1979, Ser. No. 95,640

Int. Cl.[3] **C10G** *1/00, 19/08;* **C07C** *37/68, 19/08*

U.S. Cl. 208—263 **18 Claims**

1. A process for removing phenols from a phenol-containing coal liquid and regenerating the phenols, the process comprising:

(a) containing the coal liquid with a multivalent metal composition selected from the group consisting of oxides and/or hydroxides of one or more multivalent metals capable of forming a hydroxy metal phenate with the phenols of the stream, wherein said contacting is performed at temperatures lower than the decomposition temperature of the hydroxy metal phenate;

(b) separating the hydroxy metal phenate from the treated stream; and

(c) heating the hydroxy metal phenate to its decomposition temperature, thereby forming phenols and oxides of the multivalent metal.

4,256,569

ARRANGEMENT TO IMPROVE THE OPTIMIZATION OF THE VALUE OF FINISHED CUTS IN A LIVESTOCK PROCESSING PLANT

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 29, 1979, Ser. No. 42,733

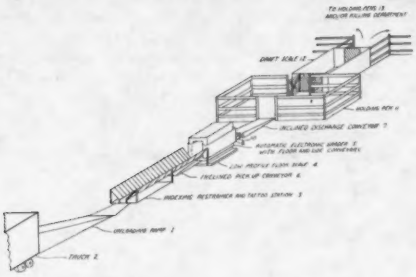
Int. Cl.[3] **B07C** *9/00;* **G01G** *19/40*

U.S. Cl. 209—3.3 **28 Claims**

1. An arrangement to improve the optimization of the value of finished cuts obtained from each of a plurality of heads of livestock in a livestock processing plant comprising:

first means to apply a different identification mark to each of said plurality of heads of livestock and to couple each of said marks to an optimization computer, each of said marks remaining with its associated one of said plurality of heads of livestock until said finished cuts are obtained;

second means disposed adjacent said first means to separately weigh each of said heads of livestock in sequence and to couple each of the resultant weights to said computer, each of said weights being correlated with an associated one of said marks; and



third means disposed adjacent said second means to separately and automatically grade each of said heads of livestock in sequence and to couple each of the resultant grades to said computer, each of said grades being correlated with an associated one of said marks and an associated one of said weights.

4,256,570

PURIFICATION OF PHOSPHORIC ACID

Hanceford L. Allen, Bartow; and William W. Berry, Lakeland, both of Fla., assignors to International Minerals & Chemical Corporation, Northbrook, Ill.

Filed Mar. 19, 1979, Ser. No. 22,083
Int. Cl.[3] B03B *1/00;* B03D *3/06;* C01B *25/16*
U.S. Cl. 209—5 **6 Claims**

1. A process for purifying filter-grade wet process phosphoric acid comprising the steps of:

(a) cooling said filter-grade acid to a temperature of from about 100° F. to about 130° F.;

(b) mixing the cooled acid of step (a) with a body feed agent to cause floccules of suspended impurities to form;

(c) adding a flocculating agent to the mixture of step (b) in an amount sufficient to cause said floccules to settle;

(d) separating the supernatant acid solution from the settled sludge; and

(e) contacting said supernatant acid solution with granular activated carbon to remove remaining impurities.

4,256,571

RECOVERY OF SILICON CARBIDE WHISKERS FROM COKED, CONVERTED RICE HULLS BY SELECTIVE FLOCCULATION-LIQUID EXTRACTION

Ponisseril Somasundaran, Nyack, and Kavssery P. Ananthapadmanabhan, New York, both of N.Y., assignors to Silag, Inc., Greer, S.C.

Filed Oct. 9, 1979, Ser. No. 82,940
Int. Cl.[3] B03B *1/04, 5/60*
U.S. Cl. 209—5 **11 Claims**

1. A method for separating silicon carbide whiskers from a mixture of silicon carbide whiskers with carbonaceous silicon carbide particles comprising:

(i) shredding the mixture to a specified size;

(ii) dispersing the shredded mixture in water to form an aqueous mixture;

(iii) mixing in an effective amount of flocculating agent;

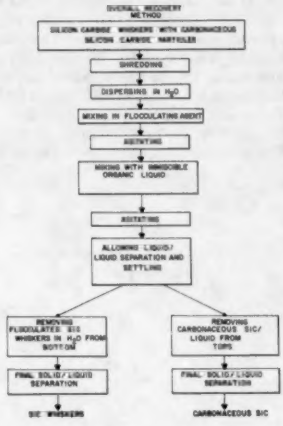
(iv) agitating the aqueous mixture;

(v) mixing the aqueous mixture with an immiscible organic liquid;

(vi) agitating the aqueous mixture and organic liquid;

(vii) allowing settling of the aqueous mixture and organic liquid so as to establish two liquid phases comprising a first phase including said organic liquid and a second phase, including said water, said second phase having an upper zone of substantially water and a lower zone of flocculated SiC whiskers;

(viii) separating the two liquid phases; and



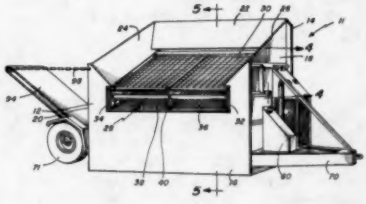
(ix) separating the solids from the aqueous mixture, thereby obtaining silicon carbide whiskers from the aqueous mixture.

4,256,572

PORTABLE SCREENING PLANT WITH OUTFEED CONVEYOR

James L. Read, Halifax, Mass., assignor to F. T. Read & Sons, Inc., Rockland, Mass.

Continuation-in-part of Ser. No. 947,380, Oct. 2, 1978, Pat. No. 4,197,194. This application Dec. 11, 1979, Ser. No. 102,613
Int. Cl.[3] B07B *1/28*
U.S. Cl. 209—257 **9 Claims**



1. A portable screening apparatus for separating coarse material from finer material comprising:

a frame of generally rectangular cross section and having a tall end and a short end joined by sides, the frame at the tall end being sufficiently wide and low to accomodate the shovel of a payloader;

a material separating shaker screen sloping downward from near the upper edge of the tall end to near the upper edge of the short end;

a set of wheels mounted to one of said sides and movable relative to the frame from an operative position for transporting said apparatus to an inoperative position for resting the frame flush on the ground;

a trailer hitch mounted to the other of said sides;

an outfeed conveyor extending from within the frame through one of said sides to carry finer material out of the frame; and

means for directing finer material which falls through the shaker screen to the conveyor.

4,256,573

PROCESS FOR BIOLOGICAL TREATMENT OF WASTE WATER IN DOWNFLOW OPERATION

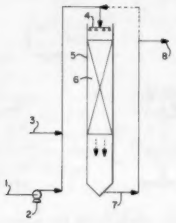
Chiaki Shimodaira, Kanagawa; Yoshinori Yushina, Musashino; Hiroshi Kamata, Tokyo; Hideo Komatsu, Mitaka; Akinori Kurima, Yokohama; Osamu Mabu, Kawasaki, and Yoshiharu Tanaka, Kanagawa, all of Japan, assignors to Chiyoda Chemical Engineering and Construction Co., Ltd., Yokohama, Japan

Filed Feb. 14, 1979, Ser. No. 12,246

Claims priority, application Japan, Feb. 14, 1978, 53-15650

Int. Cl.³ C02F *3/08*

U.S. Cl. 210—618 **7 Claims**



1. A process for biological treatment of waste water, comprising:

(a) placing particulate material in water within a reactor, said particulate material having an apparent specific gravity smaller than the specific gravity of water making it possible for said particulate material to float on water;

(b) allowing microbes to attach to said particulate material which acts as a carrier bed, floating in a substantially immersed state in said water;

(c) distributing waste water in a uniform manner, downwardly into said carrier bed to form a fluidized bed of said carrier bed, in such a manner that the biological treatment of said waste water is achieved by contacting said waste water with said microbes while said waste water is passed through said fluidized bed;

(d) removing treated water from a lower portion of said fluidized bed.

4,256,574

OZONE DISINFECTION SYSTEM

Pankaj Bhargava, Schaumburg, Ill., assignor to Sterling Drug Inc., New York, N.Y.

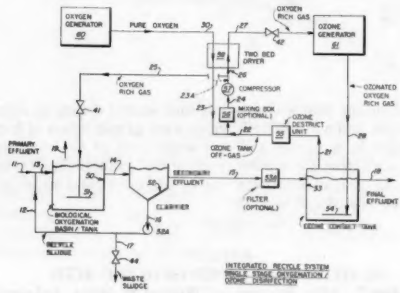
Filed Sep. 12, 1979, Ser. No. 74,791

Int. Cl.³ C02F *1/78, 3/26*

U.S. Cl. 210—614 **15 Claims**

1. In a process for the treatment of aqueous waste material in which said aqueous waste material is first flowed through an oxygen-assisted activated sludge zone in which said waste material is contacted with a first oxygen-enriched gas and liquid effluent from said sludge zone is flowed through an ozonation zone in which said effluent is contacted with an ozone containing gas, in which process said ozone-containing gas is produced in an ozone generation zone by the conversion to ozone of a portion of the oxygen in a second oxygen-enriched gas and said second oxygen-enriched gas is derived in part from a gaseous effluent from said ozonation zone, and in which process an oxygen rich gas from an external source is supplied to the process to meet oxygen requirements of the process, the improvement wherein said first oxygen-enriched gas and said second oxygen-enriched gas are derived from a single stream of gas which stream comprises a combination of substantially all of the gaseous effluent from said ozonation step and substantially all of said oxygen-rich gas from said external source and wherein the flow of said first oxygen-enriched gas is controlled in response to the oxygen requirement of said oxygen-assisted activated sludge zone and the flow of said second oxygen-enriched gas is controlled in response to the oxygen requirement of said ozonation zone.

12. In an apparatus for treating aqueous waste material comprising an oxygen treatment tank having a liquid inlet for aqueous influent and a liquid outlet for a treated liquid effluent and having a means for introducing an oxygen enriched gas thereto, an ozone contact tank having a liquid inlet and a liquid outlet and conduit means for passing said treated liquid effluent from said oxygen treatment tank to said inlet of said ozone treatment tank, an ozone generator having a gas inlet and a gas outlet, conduit means for passing gas from said ozone generator to said ozone treatment tank, conduit means for withdrawing a gaseous effluent from said ozone treatment tank, conduit means for supplying fresh oxygen-rich gas from an external source to said oxygen treatment tank and to said ozone generator the improvement wherein said conduit means for withdrawing a gaseous effluent from said ozone treatment tank and said conduit means for supplying fresh oxygen-rich gas from an external source to said oxygen treatment tank and to said ozone generator are merged at a juncture, constitute the same conduit means for a portion of the length of each of them and are separated at a fork and wherein said apparatus includes means to control the flow of said oxygen enriched gas to said oxygen treatment tank in response to the oxygen requirement in said oxygen treatment tank and means to control flow of said oxygen enriched gas to said ozone generator in response to the oxygen requirement in said ozone treatment tank.



4,256,575

APPARATUS AND METHOD FOR TREATMENT OF LIQUIDS

Michael E. Garrett, 92 York Rd., Woking, and Oliver A. Kite, 22 Hayes Close, West Wickham, both of England

Filed May 31, 1979, Ser. No. 44,348

Claims priority, application United Kingdom, May 31, 1978, 24994/78

Int. Cl.³ C02F *3/22*

U.S. Cl. 210—629 **3 Claims**

3. A process of treating aqueous waste material having a biochemical oxygen demand by generally concurrently subjecting the aqueous waste material to oxygenation, biological treatment and settling, comprising:

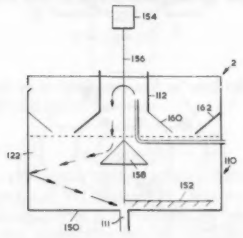
establishing a volume of the aqueous waste material in a treatment vessel as a body having a lower layer comprising a biological treatment zone which comprises a bacterial sludge-containing aqueous waste material and an upper layer comprising clarified aqueous waste material;

withdrawing aqueous bacterial sludge-containing aqueous waste material from the bottom of the lower layer and generally continuously mixing it with an incoming stream of aqueous waste material to be treated to form a mixed stream, oxygenating the mixed stream and introducing the

oxygenated mixed stream so formed into a defined stilling zone located within the upper layer of clarified aqueous waste material;

passing the oxygenated mixed stream downwardly through the stilling zone with reduced momentum through at least a portion of the upper layer of clarified waste material;

laterally and downwardly deflecting the oxygenated mixed stream passing through said at least a portion of the upper layer of clarified aqueous waste material by providing baffle means within the treatment vessel which includes a first baffle device for deflecting the aqueous waste material as it leaves the stilling zone towards a side of the vessel, a second baffle device attached to the lower end of a box defining the stilling zone which together with a third baffle device attached to the walls of the vessel opposite the second baffle device inhibits the aqueous waste material from entering the upper layer of clarified aqueous waste material, whereby the mixing of the aqueous waste material in the lower zone of the vessel is enhanced while disturbance of clarified aqueous waste material in the upper zone is reduced; and

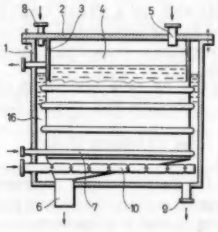


withdrawing clarified aqueous liquor from the upper layer.

4,256,576
PROCESS FOR SEGREGATING SOLID SUBSTANCES FROM A LIQUID PHASE

Tibor Blickle, Budapest; Zsigmond Komaromy, Veszprem; Judit Filka, Veszprem; Janos Gyenis, Veszprem, and Oszkar Borlai, Budapest, all of Hungary, assignors to Magyar Tudomanyos Akademia Müszaki Kemiai Kutato Intezet, Veszprem, Hungary

Filed Mar. 29, 1974, Ser. No. 456,254
Int. Cl.³ B01D *17/00;* **F28D** *11/06;* **F28G** *7/00*
U.S. Cl. 62—538 **3 Claims**



1. A process for segregating solid substances by heat transfer from a liquid phase, which comprises separating the space containing the substance to be segregated by a thin elastic membrane from the space containing a heat transfer liquid, maintaining the contents of one of the spaces by heating or cooling at a temperature different from the temperature of the contents of the other of said spaces, foaming or fluidizing the heat transfer liquid by injecting a gas into the lower portion thereof, whereby dynamic local pressure variations are created by the rising gas bubbles causing a pulsing of the membrane, and separation therefrom of the solid substance aggregates adhering thereto.

4,256,577
TWO STEP REMOVAL OF METAL IONS FROM EFFLUENTS

Vincent J. Cassella, Crystal Lake, Ill., and Mazin R. Irani, King of Prussia, Pa., assignors to PQ Corporation, Valley Forge, Pa.

Filed Jun. 18, 1979, Ser. No. 49,703
The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.
Int. Cl.³ C02F *1/52*
U.S. Cl. 210—738 **3 Claims**

1. A process for reducing the metal ion concentration of aqueous effluents to less than 0.1 part per million (ppm) consisting of the sequential steps of:

a. Agitating an aqueous effluent containing up to 1500 ppm of a metal ion selected from the group consisting of divalent manganese, copper, cadmium, lead, iron, cobalt, nickel and zinc and trivalent chromium and iron;

b. Adding an aqueous solution of an inorganic base to adjust the pH of the effluent to a value between 7.0 and 9.0;

c. Adding 0.3 to 1.3% by weight of hydrated amorphous magnesium silicate to the neutral or slightly basic effluent, thereby forming an insoluble metal-magnesium silicate complex;

said hydrated amorphous magnesium silicate being characterized by:

Mole Ratio (SiO_2/MgO: 1.75 to 4.0
Average Particle Size (microns): 10 to 55
Surface Area (m^2/g): 35 to 65
Bulk Density Tamped (g/cc): 0.40 to 0.75
Weight Loss at 105° C. (wt. %): 5 to 15
Ignition Loss (wt. %): 10 to 30

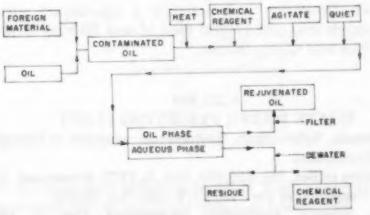
d. Continuing the agitation for a period sufficient for said metal-magnesium complex to form; and

e. Separating the insoluble material from the aqueous effluent which now contains less than 0.1% of the metal ions.

4,256,578
WASTE OIL RECOVERY PROCESS

Robert S. Kozar, Livonia, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Nov. 29, 1979, Ser. No. 98,547
Int. Cl.³ C10M *11/00*
U.S. Cl. 210—766 **1 Claim**



1. In an industrial metal manufacture such as aluminum processing wherein oil is used as a lubricant and coolant during said processing with said oil becoming contaminated with produced metallic fines and other foreign materials so as to be unusable, an improved process of rejuvenating said contaminated oil comprising the steps of:

(1) preparing a dilute alkaline solution using about nine parts of water and one part of sodium metasilicate,

(2) heating said contaminated oil to a temperature range of about 140° F. to about 160° F.,
(3) adding said alkaline solution to said heated oil in an amount of about 10% by volume of said contaminated oil,
(4) agitating said heated contaminated oil and said alkaline solution for about 15–20 minutes to cause a thorough intermixing thereof to insure a substantially complete reaction therebetween to produce a reacted mixture,
(5) quieting said reacted mixture for about 30 minutes to allow a phase separation comprising an upper oil phase and lower aqueous phase,
(6) decanting said oil phase from said aqueous phase,
(7) filtering said oil phase to produce rejuvenated oil reusable in said manufacture, and
(8) dewatering said aqueous phase to produce a substantially reusable alkaline solution and a residue comprising said metallic fines, metallic silicates, and traces of foreign materials.

4,256,579

FILTER FOR LIQUIDS

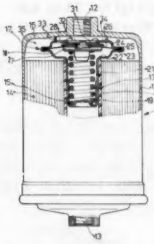
Klaus Rose, Mundelsheim; Ulrich Kemmner, Sachsenheim, and Peter Ringwald, Rutesheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 92,717

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905918

Int. Cl.³ B01D *35/14*

U.S. Cl. 210—90 **14 Claims**



1. A filter for liquids, comprising a housing having two ends, and an inlet and an outlet spaced from each other and each provided at a respective one of said ends; a filtering element accommodated in said housing and having a central tube; a vibration damper located in said housing in the region between one of said ends of said housing and said filtering element, said vibration damper having a membrane, a spring biasing said membrane, and a casing arranged to accommodate said membrane and said spring and including a cup-shaped portion which extends into said central tube of said filtering element and receives said spring therein.

4,256,580

WASTE WATER PURIFYING PLANT

Karl Rimmele, Schmerikon, Switzerland, assignor to Mecafina S.A., Switzerland

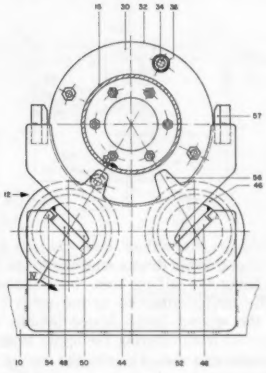
Continuation of Ser. No. 839,498, Oct. 5, 1977, abandoned. This application Jun. 15, 1979, Ser. No. 48,825

Claims priority, application Switzerland, Oct. 8, 1976, 12774/76

Int. Cl.³ B01D *21/18*

U.S. Cl. 210—151 **27 Claims**

1. A mechanico-biological waste water purifying plant of the type which includes a trough through which the waste water flows, a dip-drip body, a pair of coaxial shaft end means attached to opposite sides of said body for rotation of said body, bearing means for rotatably supporting said shaft end means which are so disposed within said trough that in use said body is partially immersed in said waste water with the axis of rotation substantially horizontal, and driving means for rotating said body, wherein said body comprises a plurality of discs spaced apart along said axis of rotation; and body interconnection means for holding each of said discs in position within said body, said body interconnection means being attached to said shaft end means; each of said discs having a plurality of substantially identical openings each in axial registration with corresponding substantially identical openings in every other one of said discs, and said body interconnection means including a plurality of plug spacers each having a spacer end larger than one of said openings, said spacer end being of such a



length to closely space apart one said disc from the next of said discs, and a plug end dimensioned to fit through and extend beyond said opening, said spacer end further having a cavity to receive said plug end of another said plug spacer extended beyond another said opening, one said plug spacer extending through and beyond each said opening in each said disc into said cavity of the next said plug spacer fitted through the axially registered corresponding opening in the next said disc, whereby a sequence of said plug spacers each plugged into the next extends parallel with said axis of rotation through any one of said openings and every said corresponding opening in every said disc which is in axial registration with said one opening.

4,256,581

APPARATUS FOR PREPARING GRANULAR MATERIAL BY MEANS OF A STRIP CASTER

Karl G. Boman, and Konrad Schermutzki, both of Remseck, Fed. Rep. of Germany, assignors to Sandvik Conveyor GmbH, Fed. Rep. of Germany

Filed Oct. 25, 1979, Ser. No. 88,115

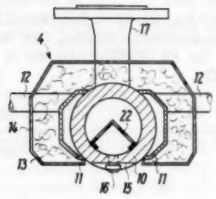
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847887

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—173 **7 Claims**

1. In apparatus for the preparation of granulate from hot-melt mixes, said apparatus comprising a strip pourer connected by a filter-containing conduit to at least one mixing and melting device, said strip pourer disposed above a cooling conveyor which receives melt from said pourer, cools the melt, and feeds the cooled melt to a crushing device, said pourer comprising a heated hollow tubular body provided on its under side with discharge nozzles arranged in at least one row, the improvement wherein a filter is disposed within said tubular body across said discharge nozzles, said filter comprising an elongate insert extending over the entire length of said tubular body and above said nozzles, the insert being of inverted substantially V-shaped cross-section and including two legs extending

downwardly and engaging the inside wall of the tubular body on opposite sides of the discharge nozzles, and a detachable



cover disposed on at least one end of said tubular body for replacement of said insert.

4,256,582

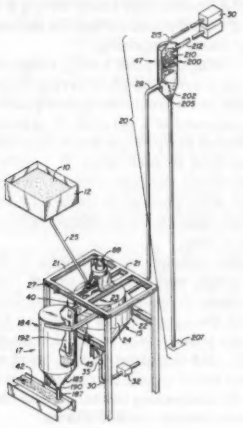
CONTINUOUS SEPARATION SYSTEM

Joseph C. V. Ducasse, 391 Donegal Pl., Martinez, Calif. 94553

Continuation-in-part of Ser. No. 906,078, May 15, 1978, abandoned. This application Aug. 15, 1979, Ser. No. 66,712

Int. Cl.³ B01D *33/24*

U.S. Cl. 210—297 **9 Claims**



1. A separator for use in a continuous separation system for separating liquid and solid material in a slurry comprising:

means defining a stationary casing;

a horizontal screen assembly disposed within said casing and mounted for rotation relative thereto about a vertical axis, said screen assembly being liquid pervious over a predetermined radial range, said screen assembly dividing the interior of said casing into respective upper and lower chambers;

said lower chamber having means defining a first outlet for permitting liquid to flow therethrough and means defining a second outlet disposed above said first outlet to permit evacuation of said casing;

a fixed scraper assembly above said screen assembly and substantially in contact therewith, said fixed scraper assembly extending at least over said predetermined radial range;

inlet conduit means proximate said fixed scraper assembly on a first side thereof for depositing said slurry on said screen assembly to form a layer on said screen assembly as said screen assembly rotates relative to said inlet conduit means;

entraining means on the opposite side of said fixed scraper assembly above said screen assembly for directing a gas stream across the path of solids as they encounter said fixed scraper assembly, said gas stream entraining said solids, completing the drying thereof, and directing said entrained solids to a separator; and

means for directing gas into said upper chamber to pass through said slurry layer when said lower chamber is evacuated to displace said liquid through said screen assembly and dry said remaining solids so that a portion of said layer approaching said fixed scraper assembly comprises substantially dried solids capable of being entrained by said entraining means.

4,256,583

FLUSH-BACK FILTER

Rudiger Lennartz, Pulheim, Fed. Rep. of Germany, assignor to Boll & Kirch Filterbau GmbH, Cologne, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 74,154

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 7831128[U]

Int. Cl.³ B01D *29/38*

U.S. Cl. 210—333.1 **9 Claims**

1. In a filter apparatus comprised of: a pair of filter element chambers; a valve housing having an inlet port, an outlet port, a sludge outlet port and a plurality of filter housing inlet and outlet openings; a rotary valve member in said housing and arranged to selectively interconnect said ports with said openings through internal passages in said valve housing, the improvements which comprise: said valve housing having an upwardly facing surface in which said openings are located; said surface forming a common mounting base for said pair of filter element chambers; said chambers having generally vertically extending axis; said valve member having a generally horizontal axis of rotation perpendicular to said vertical axes, and said inlet and outlet ports and said sludge outlet port all being located in a common horizontal plane.

4,256,584

INJECTION MOLDING FILTER ASSEMBLY

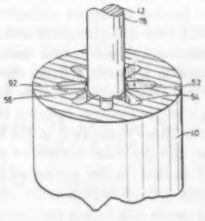
John Lord, Georgetown, and Jobst U. Gellert, Glen Williams, both of Canada, assignors to Mold-Masters Limited, Georgetown, Canada

Filed Jul. 25, 1979, Ser. No. 60,827

Claims priority, application Canada, Jul. 20, 1979, 332292

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—446 **5 Claims**



1. An improved injection molding filter assembly to filter pressurized melt flowing therethrough comprising:

(a) an elongated hollow outer member having a central longitudinal axis, a first end and a second end, the first end having an inlet opening and the second end having an outlet opening, the outer member having a fluted inner surface defining an even number of inwardly opening longitudinally extending channels with narrow elongated lands therebetween, the lands all being located an equal distance from the central axis along their length, alternate ones of the channels extending from the inlet opening to

first blind ends towards the second end of the outer member, the other intervening channels extending from the outlet opening to second blind ends towards the first end of the outer member, and

(b) an elongated inner torpedo member centrally located in the outer member, having a generally cylindrical outer surface which is smaller in diameter by a predetermined amount than the said distance of the lands from the said central axis to form a number of elongated filtering slits between the outer surface of the inner member and said lands through which the melt flows from the inlet channels to the outlet channels, the inner torpedo member being longitudinally secured to have the cylindrical outer surface extend at least between the first and second blind ends, impurities too large to pass through the filtering slits being accumulated at the blind ends of the inlet channels.

4,256,585

COFFEE FILTER WITH DRIP TRAY

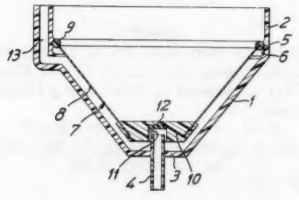
Albert Greutert, Sachseln, Switzerland, assignor to Maxs AG, Sachseln, Switzerland

Filed Apr. 21, 1980, Ser. No. 142,093

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 7911828[U]

Int. Cl.³ B01D *25/04*

U.S. Cl. 210—474 **5 Claims**



1. A coffee filter comprising a drip catcher, a substantially conical container having an upper cylindrical region and a filter insert inserted into the container and comprising filter surfaces of a frustoconical perforated metal foil (**8**), which surfaces are situated at a distance from the wall of the container thereby establishing an intermediate space and the container comprising a single outflow opening in its base, characterised in that the outflow opening is in the form of a tube (**4**) which projects beyond the inner surface of the base (**3**) of the container (**1**), and in that, in the region of its base, the filter insert (**7**) comprises a fluid-impermeable cover element (**10**) which is provided on its side facing the container with a blind hole (**11**) having a soft disc (**12**) inserted therein, which blind hole in the operational state of the coffee filter, surrounds the tube (**4**) over part of its length with a gap in between, said filter insert (**7**) being designed to be locked in at least two rest positions on the container (**1**), in that in one rest position the cover element (**10**) is at a distance from the tube (**4**) on all sides and in that, in the other rest position, the bottom of the blind hole (**11**) rests on the front edge of the tube (**4**), said rest position being determined by a first annular depression (**5**) and an axially second annular depression (**6**) on the inner surface of the cylindrical region (**2**).

4,256,586

FRAME FOR BAG-TYPE FILTERS

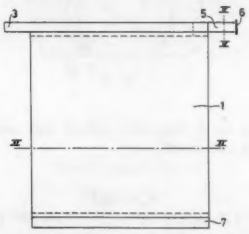
Bertil Röos, Stenungsund, and Anders Ullman, Ljungaverk, both of Sweden, assignors to Perma Scand AB, Ljungaverk, Sweden

Filed Apr. 24, 1979, Ser. No. 32,892

Claims priority, application Sweden, Oct. 30, 1978, 7811208

Int. Cl.³ B01D *25/04, 46/10*

U.S. Cl. 210—487 **2 Claims**



1. In the combination of a filter cloth shaped as a bag and a filter frame positioned within the bag so as to keep the sides of the cloth bag from contacting each other, the improvement consisting of a flexible filter frame having a thickness that can be temporarily compressed during the filtration operation, said flexible filter frame comprising:

(a) a first corrugated plate having ridges and valleys,

(b) a second corrugated plate having ridges and valleys,

(c) said first and second corrugated plates

being composed of a network of expanded metal,

being free of sharp ridges and valley folds,

being secured to each other in such a manner that the ridges of one plate are in linear contact with the valleys of the other plate so as to thereby form a plurality of parallel channels for the filtrate between adjacent linear contact lines,

(d) an outlet passageway for filtrate in the form of a discharge tough, said discharge trough connecting the ends of said channels for receiving filtrate flow from said channels, said discharge trough extending along the edges of the plates transversely to the longitudinal axes of said channels, said discharge trough being made of the same expanded metal as said corrugated plates, and

(e) a pipe for connecting the end of said discharge trough to a collection means for said filtrate.

4,256,587

SILICEOUS ADSORBENT FOR HEAVY METALS

Thomas G. Carnahan, Sparks, and Charles M. Flynn, Jr., Reno, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 27, 1979, Ser. No. 97,756

Int. Cl.³ C02F *1/42, 1/62*

U.S. Cl. 210—670 **12 Claims**

1. A method for removing heavy metal ions from aqueous solution comprising the steps of:

(a) activating a high surface-to-weight ratio, porous siliceous adsorbent material, from the group consisting of kaolin leach residue, diatomaceous earth, fly ash and silica flour, with alkali metal ions by contacting said siliceous adsorbent material with an aqueous solution of the basic salt of an alkali metal; and

(b) contacting said activated siliceous adsorbent material with said heavy metal ion-containing aqueous solution; whereby said heavy metal ions exchange with said alkali metal ions to decrease the concentration of heavy metal ions in said heavy metal ion-containing aqueous solution.

4,256,588

SEPARATION AND RECOVERY OF B AND T LYMPHOCYTES

Harvey H. Hoehn, Hockessin, and Stephen T. Toy, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 2, 1979, Ser. No. 90,677
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—692 **7 Claims**

1. A process comprising passing an aqueous suspension of a mixture of B lymphocytes and T lymphocytes through a bed of synthetic polymeric granules having a diameter of from 0.1 to 5 mm at a temperature of from about 4° C. to about 25° C. whereby the B lymphocytes become adhered to the granules and the T lymphocytes pass through the bed.

4,256,589

FIBER TREATING COMPOSITIONS COMPRISING (A) BLEND OF RANDOM COPOLY(OXYETHYLENE-OXYPROPYLENE)-BUTANOLS (B) ALKALI METAL SULFUR COMPOUND AND (C) ALKALI METAL ORGANIC PHOSPHATE COMPOUND

Bobby C. Carver, and Raymond E. Donaldson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 878,342, Feb. 16, 1978, Pat. No. 4,169,061, which is a continuation of Ser. No. 679,257, Apr. 22, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,235
The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.
Int. Cl.³ D06M *13/10, 13/18, 13/26, 13/32*
U.S. Cl. 252—8.7 **16 Claims**

1. A textile treating composition comprising as the lubricant a blend of a major amount of a random copoly(oxyethyleneoxypropylene) butanol having a viscosity of lower than 300 seconds at 100° F. in Saybolt Universal Seconds (SUS), and a minor amount of a random copoly(oxyethylene-oxypropylene) butanol having a viscosity of not less than 2000 seconds at 100° F. in Saybolt Universal Seconds (SUS), said polyoxyalkylene blend having a vicosity between 300 and 5,000 SUS at 100° F., and a processing aid (A) from about 1 to 8 percent by weight of an alkali metal lower alkyl aryl sulfonate or an alkali metal lower alkyl sulfosuccinate and (B) from more than 12 to about 30 percent by weight of an ethoxylated fatty and/or lower alkyl aryl alcohol alkali metal phosphate.

4,256,590

MODIFIED HETEROPOLYSACCHARIDES AND THEIR PREPARATION

Lars A. Naslund, Morganville, N.J., and Allen I. Laskin, New York, N.Y., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 794,725, May 9, 1977, Pat. No. 4,182,860, which is a continuation-in-part of Ser. No. 630,468, Nov. 10, 1975, abandoned. This application Apr. 11, 1979, Ser. No. 28,967
Int. Cl.³ E21B *43/22*; C12P *19/06*
U.S. Cl. 252—8.55 D **6 Claims**

1. A process for recovering oil from a subterranean formation penetrated by at least one injection well and at least one production well by injecting an amount effective to provide mobility control of an aqueous solution containing a heteropolysaccharide produced by the action of bacteria of the genus Xanthomonas into said injection well and into said subterranean formation to displace oil from the formation and producing oil from said subterranean formation by means of said production well, wherein said heteropolysaccharide has been prepared by a process comprising the steps of:

(a) preparing an aqueous solution which contains
  (i) from about 200 to about 30,000 parts per million by weight, of said heteropolysaccharide, and
  (ii) at least about 0.5 weight percent of at least one inorganic salt to obtain a saline heteropolysaccharide solution;

(b) heating said saline heteropolysaccharide solution to a temperature of at least about 100° C.;

(c) maintaining said saline heteropolysaccharide solution at a temperature of at least about 100° C. for a period of time sufficient to increase the injectivity and filterability characteristics of the heteropolysaccharide but for an insufficient time to impair the viscosity imparting properties of the saline-heat treated heteropolysaccharide; and

(d) removing or separating proteinaceous materials and/or residual whole bacterial cells or other cell debris from the saline and heat-treated heteropolysaccharide product to thereby obtain a modified heteropolysaccharide such that the modified heteropolysaccharide is capable of imparting a viscosity of at least 4.0 centipoises to an aqueous test solution containing 2 wt.% NaCl and 0.2 wt.% $CaCl_2$ when said modified heteropolysaccharide is added to said solution at a concentration of approximately 600 ppm, by weight, as measured on a Brookfield viscosimeter with a UL adapter at 60 rpm at 25° C. and said modified heteropolysaccharide is further capable of imparting a filterability such that more than 1000 ml of a different aqueous test solution containing 8.8 wt.% salt comprised of NaCl and $CaCl_2$ on a 10:1 wt. ratio and approximately 600 ppm concentration, by weight, of said modified heteropolysaccharide will pass without plugging through a Millipore ® filter having a diameter of 13 mm and a pore size of about 5 microns at a constant pressure drop of about 1.55 psig.

4,256,591

LUBRICANT, LUBRICANT COMPOSITION AND METHOD FOR LUBRICATING A SURFACE

Satoshi Yamamoto; Toshiyuki Hirae, both of Ibaragi, and Yasunori Koizumi, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Yukamelamin Company, Limited, both of Tokyo, Japan

Filed Aug. 24, 1979, Ser. No. 69,404
Claims priority, application Japan, Aug. 24, 1978, 53-103229
Int. Cl.³ C10M *1/20, 1/32, 7/16, 7/30*
U.S. Cl. 252—12 **44 Claims**

1. A method for lubricating a surface which comprises applying an adduct of melamine and cyanuric acid or isocyanuric acid to a surface which is subject to wear.

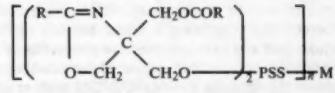
4,256,592

PHOSPHORUS-CONTAINING COMPOUNDS AND LUBRICANTS CONTAINING SAME

Robert M. Gemmill, Jr., Pitman, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 11, 1979, Ser. No. 83,749
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—46.7 **21 Claims**

1. A compound of the formula



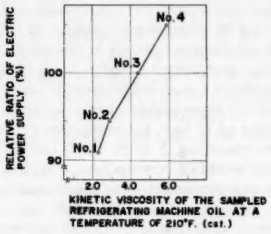
wherein R is a hydrocarbyl group containing 9 to 50 carbon atoms, M is a metal ion or a metal-containing radical and n is the valence of M wherein said metal ion or the metal in said metal-containing radical is selected from Groups IIA, IIB VIA or VIII of the Periodic Table.

4,256,593

REFRIGERATING MACHINE OIL

Kenji Nozawa, Osaka, Japan, assignor to Matsushita Reiki Co., Ltd., Osaka, Japan

Filed Aug. 17, 1979, Ser. No. 67,763
Claims priority, application Japan, Aug. 18, 1978, 53/101227
Int. Cl.³ C10M *1/00, 1/46*
U.S. Cl. 252—49.8 **2 Claims**



1. A refrigerating machine oil comprising low volatile distillates of naphthenic type oil, in which the kinetic viscosity is within 7.0 to 13.0 cst. at a temperature of 100° F. and, within 2.0 to 2.5 cts. at a temperature of 210° F., respectively, with a seizure load of more than 450 lbs in respect to the falex test said refrigerating machine oil having a pour point below −45° F. and a flock point below −35° F.

4,256,594

HOT MELT METAL WORKING LUBRICANTS CONTAINING PHOSPHORUS-CONTAINING COMPOSITIONS

Joseph J. Rysek, Painesville, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 35,976, May 4, 1979, abandoned. This application Sep. 21, 1979, Ser. No. 77,812
Int. Cl.³ C10M *1/46*
U.S. Cl. 252—49.9 **35 Claims**

1. A composition which melts between about 30° and about 150° C. and which provides lubricity to metal surfaces, said composition comprising a major amount of at least one ester or of a polymer of at least one monoepoxide, monoepisulfide or mixture thereof and containing a minor amount sufficient to furnish antioxidant and extreme pressure properties of a phosphorus-containing composition comprising at least one compound having the formula

$$(R'\text{-}AR'OR^2O)_2POH$$

wherein:

Each R^1 is independently an aliphatic hydrocarbon-based radical having from about 4 to about 100 carbon atoms;

each R^2 is independently an ethylene, trimethylene, lower alkyl-substituted ethylene or lower alkyl-substituted trimethylene radical; and

each Ar^1 is independently an aromatic radical.

13. A composition which melts between about 30° and about 150° C. and which provides lubricity to metal surfaces, said composition comprising a major amount of at least one ester or of a polymer of at least one monoepoxide, monoepisulfide or mixture thereof and containing a minor amount sufficient to furnish antioxidant and extreme pressure properties of a phosphorus-containing composition prepared by reacting at least one alcohol of the formula $R^1—Ar^1OR^2OH$ with at least one phosphorus halide of the formula PZ_3, wherein:

R^1 is an aliphatic hydrocarbon-based radical having from about 4 to about 100 carbon atoms;

R^2 is an ethylene, trimethylene, lower alkyl-substituted ethylene or lower alkyl-substituted trimethylene radical;

Ar^1 is an aromatic radical; and

Z is chlorine or bromine.

26. A method for lubricating metal during working thereof which comprises applying to said metal a lubricating composition according to claim **1**, **6**, **7**, **8**, **12**, **13**, or **18**.

31. A metal workpiece having on its surface a film of a lubricating composition according to claim **1**, **6**, **7**, **8**, **12**, **13**, or **18**.

4,256,595

DIESEL LUBRICANT COMPOSITION CONTAINING 5-AMINO-TRIAZOLE-SUCCINIC ANHYDRIDE REACTION PRODUCT

Rodney L. Sung, Fishkill, and Benjamin H. Zoleski, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 946,694, Sep. 28, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,607
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—51.5 A **9 Claims**

1. A diesel crankcase lubricant composition comprising a diesel lubricating oil and from about 0.25 to 2.0 weight percent of the reaction product of a hydrocarbyl succinic anhydride in which the hydrocarbyl radical has from about 12 to 30 carbon atoms and 5-aminotriazole, said reaction product being prepared by reacting from 0.75 to 1.25 moles of said 5-aminotriazole with a mole of said hydrocarbyl succinic anhydride at a temperature ranging from room temperature to about 150° C.

4,256,596

OXIDATIVELY COUPLED HYDROXYAROMATIC COMPOUNDS AND FUELS AND LUBRICANTS CONTAINING THEM

Jerome M. Cohen, University Hts., Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 931,788, Aug. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 735,248, Oct. 26, 1976, abandoned. This application Sep. 26, 1979, Ser. No. 78,858
Int. Cl.³ C10M *1/20, 3/14;* C10L *1/18;* C07C *43/02*
U.S. Cl. 252—52 R **30 Claims**

1. A method for preparing an oxidatively coupled product which comprises reacting an oxidative coupling agent with a reaction mixture comprising:

(A) At least one hydroxyaromatic compound containing no aliphatic substituent having more than 4 carbon atoms; and

(B) at least one hydroxyaromatic compound containing at least one aliphatic substituent having at least about 12 carbon atoms;

at least one position ortho to a hydroxy group in each of reagents A and B being unsubstituted.

4,256,597

COMPOSITION FOR COMBINED WASHING AND BLEACHING OF FABRICS

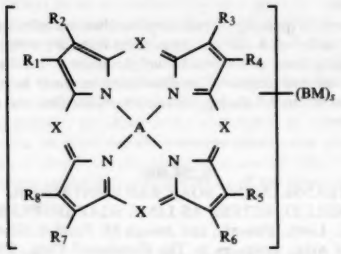
Nabil Y. Sakkab, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 10, 1979, Ser. No. 2,275
Claims priority, application Philippines, Jan. 11, 1978, 20643
Int. Cl.³ C11D *7/56, 7/32*
U.S. Cl. 252—99 **32 Claims**

1. A detergent bleach composition consisting essentially of:

(a) from about 10% to about 50% by weight of the composition of surfactants selected from the group consisting of anionic, nonionic, semi-polar, ampholytic and zwitterionic surfactants;

(b) from about 0.005% to about 0.5% by weight of the composition of a water soluble photoactivator having the formula



wherein each X is (=N—) or (=CY—), and the total number of (=N—) groups is 0, 1, 2, or 3 or 4; wherein each Y, independently is hydrogen or meso substituted alkyl, cycloalkyl, alkaryl, aryl, alkaryl or heteroaryl; wherein each R, independently, is hydrogen or pyrrole substituted alkyl, cycloalkyl, alkaryl aryl, alkaryl or heteroraryl, or wherein adjacent pairs of R's are joined together with ortho-arylene groups to form pyrrole substituted alicyclic or heterocyclic rings; wherein A is 2(H) atoms bonded to diagonally opposite nitrogen atoms, or Zn(II), Cd(II), Mg(II), Sc(III), or Sn(IV); wherein M is a counterion to the solubilizing groups; wherein s is the number of solubilizing groups; and wherein substituted into Y or R is B, a solubilizing group selected from the group consisting of (a) cationic groups, where M is an anion and s is from 1 to about 8; (b) polyethoxylate nonionic groups $—(CH_2CH_2O)_nH$, where M is zero, s is from 1 to about 8, and N=(sn)=the number of (condensed ethylene oxide molecules per porphine molecule) is from about 8 to about 50; (c) proximate anionic groups attached to atoms no more than 5 atoms displaced from the porphine core, where M is cationic and s is from 3 to about 8; and (d) remote anionic groups attached to atoms more than 5 atoms displaced from the porphine core, where M is cationic and s is from 2 to about 8; provided that anionic sulfonate groups are remote and are no greater in number than the number of aromatic and heterocyclic substituent groups;

wherein said alkyl groups are comprised of simple carbon chains or carbon chains interrupted by other chain-forming atoms;

(c) from 0 to about 80% by weight of the composition of alkaline detergent builder selected from the group consisting of inorganic and organic builders; and

(d) balance selected from the group consisting of sodium sulfate, smectite clay, alkanolamine, water, lower alcohols and glycols, and hydrotropes.

4,256,598

COMPOSITION FOR COMBINED WASHING AND BLEACHING OF FABRICS

Nabil Y. Sakkab, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 10, 1979, Ser. No. 2,414

Claims priority, application Philippines, Jan. 11, 1978, 20644

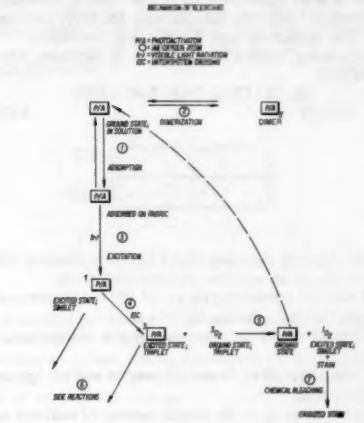
Int. Cl.[3] **C11D** *7/32, 7/56*

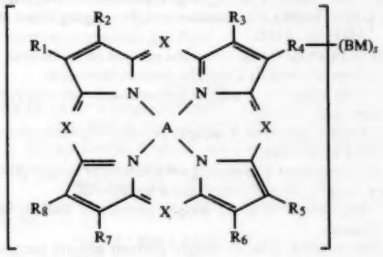
U.S. Cl. 252—99 **19 Claims**

1. A detergent bleach composition consisting essentially of:

(a) from about 10% to about 50% by weight of the composition of surfactant selected from the group consisting of anionic, nonionic, semi-polar, ampholytic and zwitterionic surfactants;

(b) from about 0.005% to about 0.5% by weight of the composition of a water soluble photoactivator having the formula





wherein each X is (=N—) or (=CY—), and the total number of (=N—) groups is 0, 1, 2, or 3; wherein each Y, independently, is hydrogen or meso substituted alkyl, cycloalkyl, aralkyl aryl, alkaryl or heteroaryl; wherein each R, independently, is hydrogen or pyrrole substituted alkyl, cycloalkyl, aralkyl aryl, alkaryl or heteroraryl, or wherein adjacent pairs of R's are joined together with ortho-arylene groups to form pyrrole substituted alicyclic or heterocyclic rings; wherein A is 2(H) atoms bonded to diagonally opposite nitrogen atoms, or Zn(II), Ca(II), Cd(II), Mg(II), Sc(III), Al(III), or Sn(IV); where B is a sulfonate group substituted into Y or R; wherein s is an integer from 3 to about 8 inclusive; and wherein M is a cation selected from the group consisting of sodium, potassium, lithium, ammonium, and mono-di- and triethanolamine; provided that the sites of sulfonation are in substituent groups comprised of aromatic or pyrido groups substituted on R or aromatic or heterocyclic groups substituted on Y, the sulfonate groups are attached to carbon atoms no more than 5 atoms displaced from the porphine core, and the number of the sulfonate groups is no greater than the number of said substituent groups;

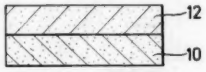
(c) from 0 to about 80% by weight of the composition of alkaline detergent builder selected from the group consisting of inorganic and organic builders; and

(d) balance selected from the group consisting of sodium sulfate, smectite clay, alkanolamine, water, lower alcohols and glycols, and hydrotropes.

4,256,599
DENTURE CLEANSING TABLET AND PROCESS FOR MAKING

Werner Krisp, Heinestr. 9, 6940 Weinheim; Rainer Malkowski, Bahnhofstr. 4, 8204 Brannenburg, and Mira Reuss, Nietzschestr. 4, 6800 Mannheim, all of Fed. Rep. of Germany

Continuation of Ser. No. 825,035, Aug. 16, 1977, abandoned.
This application Apr. 3, 1979, Ser. No. 26,498
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647364
Int. Cl.³ C11D *7/18, 7/40, 17/00*
U.S. Cl. 252—99 **4 Claims**



1. A two-layered cleansing tablet for the self-acting cleansing of dentures in an aqueous solution comprising

(A) a first layer comprising on a total 100 weight percent dry weight first layer basis a mixture of

(1) from about 35 to 50 weight percent sodium bicarbonate,

(2) from about 20 to 30 weight percent sodium hexametaphosphate,

(3) from about 15 to 20 weight percent of sulfamic acid,

(4) from about 2 to 6 weight percent of ethylene diamine tetraacetate,

(5) from about 1 to 4 weight percent of polyethylene glycol having a molecular weight ranging from about 18,000 to 24,000,

(6) from about 0.5 to 2 weight percent of surfactant,

(7) from about 0 to 2 weight percent bentonite,

(8) from about 0 to 1 weight percent hardened triglyceride powder,

(9) from about 0 to 2 weight percent 4-hydroxybenzoic acid alkyl ester,

(B) a second layer comprising on a total 100 weight percent dry weight second layer basis a mixture of

(1) from about 15 to 25 weight percent of sodium bicarbonate,

(2) from about 8 to 15 weight percent sodium hexametaphosphate,

(3) from about 1 to 8 weight percent ethylene diamine tetraacetate,

(4) from about 10 to 15 weight percent acidic sodium pyrophosphate,

(5) from about 25 to 35 weight percent of an alkali metal salt of peroxymonosulfuric acid,

(6) from about 1 to 4 weight percent polyethylene glycol having a molecular weight ranging from about 18,000 to 24,000,

(7) from about 3 to 6 weight percent water soluble starch,

(8) from about 1 to 3 weight percent of polymeric dye carrier manifesting surface active cleansing properties and selected from the the group consisting of sodium polyacrylate and a water soluble cross linked polyvinyl pyrrolidone having a k-value of from about 24 to 27,

(9) from about 1 to 3 percent dibasic calcium phosphate having a heavy metal content of less than about 0.1 percent by weight,

(10) from about 1 to 3 weight percent surfactant,

(11) from about 0 to 2 weight percent of sugar fatty acid esters wherein from about 30 to 70 weight percent thereof comprises stearate and 70 to 30 weight percent thereof comprises palmitate fatty acid components on a 100 weight percent total ester basis and with a monoester content of 40 to 70 weight percent and a di-and tri-ester content of 60 to 39 weight percent on a 100 weight percent total ester basis,

(12) from about 0 to 2 weight percent 4-hydroxybenzoic acid alkyl ester,

(13) from about 0 to 3 weight percent hardened triglyceride

(C) the total quantity of said ethylene diamine tetraacetate in said tablet on a 100 weight percent total dry weight basis ranging from about 5 to 10 weight percent and the pH of the solution produced on dissolution in water being from about 6.5 to 7.0 during dissolution of the first and second layers.

4,256,600
TRANSLUCENT SOAP BAR CONTAINING CITRONELLYL ESTERS AS LIME SOAP DISPERSANTS

Ronald G. Lewis, Phoenix, and Joseph M. Pavelek, Scottsdale, both of Ariz., assignors to The Greyhound Corp., Phoenix, Ariz.

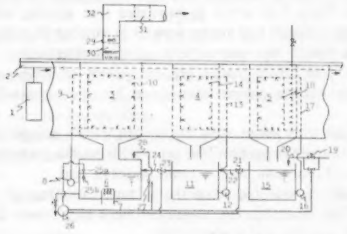
Filed Mar. 13, 1978, Ser. No. 885,725
Int. Cl.³ C11D *9/26, 17/00*
U.S. Cl. 252—132 **9 Claims**

1. A translucent soap bar composition comprising a fatty acid soap; about 0.5% to 30% of at least one alcohol selected from the group consisting of polyalkylene glycols having molecular weights from about 200 to about 4,000 and polyols having molecular weights from about 62 to about 342, and mixtures thereof; and an amount of a citronellyl ester effective to make the composition deodorant and lime soap dispersant without destroying the translucency of the bar.

4,256,601
DEGREASING COMPOSITION FOR TREATING METAL SURFACE

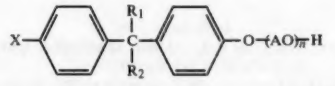
Tamotsu Sobata, Sakai, and Nobuo Nakatani, Kobe, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 19, 1978, Ser. No. 971,831
Claims priority, application Japan, Dec. 23, 1977, 52-155893
Int. Cl.³ C11D *1/83, 3/075*
U.S. Cl. 252—135 **12 Claims**



1. A degreasing composition useful for treating a metal surface, comprising

(1) a compound of the formula:



I

wherein X is hydrogen or hydroxy, R_1 and R_2 are the same or different and each is hydrogen or methyl, AO is an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide, at least 50 mol % of the total AO groups being ethylene oxide, and n is 3 to 20, which is dissolved in water, the amount of said compound of formula I being 0.001 to 5% by weight based on the total weight of the composition, and

(2) a defoaming agent selected from the group consisting of a water-soluble nonionic surfactant having a cloud point

of not more than 40° C. and a water-insoluble nonionic surfactant in an amount of 0.05 to 5 parts by weight per one part by weight of said compound of formula I.

12. A composition according to claim **2**, **3**, **4**, **5**, **6**, **7**, **1**, **10** or **11**, wherein the composition further comprises a builder selected from the group consisting of phosphoric acid, sulfuric acid, nitric acid, citric acid, lactic acid, tartaric acid, an alkali metal hydroxide, an alkali metal carbonate, an alkali metal bicarbonate, an alkali metal silicate, an alkali metal phosphate and an alkali metal polyphosphate in an amount which is effective to improve the degreasing activity of the composition.

4,256,602

FLUOROBORATE COMPLEX COMPOSITION AND METHOD FOR CLEANING ALUMINUM AT LOW TEMPERATURES

Hugh D. McLaughlin, Jr., Somerdale Camden, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 1, 1978, Ser. No. 965,720

Int. Cl.³ C11D *7/08*

U.S. Cl. 252—142 **4 Claims**

1. An aqueous cleaning composition for removing and dissolving aluminum fines and cleaning lubricating oils from aluminum surfaces consisting essentially of from about 0.5 to 2.0% by volume of cleaning solution comprised of 93 to 88% by weight of 41.1°Be' sulfuric acid and 7 to 12% by weight of wetting and dispersing agents and 0.005 to 0.10% by volume of fluoroborate complex derived from reacting hydrofluoric acid with boric acid in a ratio of 1.2 to 1 by weight.

4,256,603

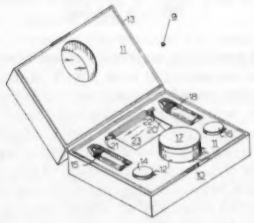
COMPOSITION FOR REPAIR OF PORCELAIN DENTAL PROSTHESES

Robert L. Ibsen, and William R. Glace, both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.

Division of Ser. No. 787,754, Apr. 15, 1977, Pat. No. 4,117,595. This application Jul. 21, 1978, Ser. No. 926,943

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—182 **2 Claims**



1. A bonding agent for adhering a metal base to a vitreous powder containing restorative agent in the in situ repair of damaged or fractured porcelain dental prostheses which consists essentially of a butanol solution of 0.5% to 25% by weight of said solution of gamma-methacryloxypropyltrimethoxysilane and 0.25% to 12% by weight of said solution of gamma-glycidoxypropyltrimethoxysilane.

4,256,604

METHOD FOR MIXING GASES AND APPARATUS USED THEREFOR

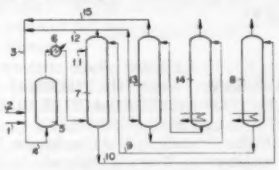
Kenji Aida, Yokosuka; Takeshi Yamamoto, Tokyo, and Toshihiko Kumazawa, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 23, 1978, Ser. No. 953,568

Claims priority, application Japan, Oct. 26, 1977, 52-127646

Int. Cl.³ C07D *301/08, 301/10*

U.S. Cl. 252—188.3 R **12 Claims**



1. A method for mixing a hydrocarbon-containing gas flow with a molecular oxygen-containing gas flow, wherein at least one aqueous medium sealing zone allowing the hydrocarbon-containing gas flow to pass therethrough is provided by sealing a side of introducing said gas flow with an aqueous medium and at least one shielding zone for flame propagation allowing said gas flow to pass therethrough is provided on a side of discharging said gas flow, and the molecular oxygen-containing gas flow is introduced in a gas mixing zone defined between both of the above zones to be thoroughly mixed with the hydrocarbon-containing gas flow.

4,256,605

SURFACTANT COMPOSITION, AND CONCENTRATE AND EMULSION INCLUDING SAME

Alan S. Baker, Slough, England, assignor to Imperial Chemical Industries Limited, London, England

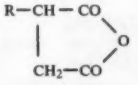
Filed Mar. 12, 1979, Ser. No. 19,333

Claims priority, application United Kingdom, Mar. 23, 1978, 11679/78

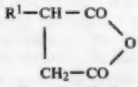
Int. Cl.³ B01J *13/00;* **B01F** *17/36*

U.S. Cl. 252—312 **11 Claims**

1. A surfactant composition which comprises (a) from 50% to 80% by weight of a polyester obtained by the condensation of (i) an alk(en)yl succinic anhydride of the formula



where R is a saturated or unsaturated hydrocarbon substituent derived from a polymer of a mono-olefin, the said polymer chain having a molecular weight of from about 600 to 1000 and (ii) a polyalkylene glycol which has a molecular weight of 400 to 20,000 and is soluble in water to the extent of at least 5% by weight at 25° C., the polyester so obtained containing 10% to 80%, by weight of residues of the polyalkylene glycol (ii); and (b) from 50% to 20% by weight of a polyester obtained by the condensation of (iii) and alk(en)yl succinic anhydride of the formula



where R^1 is an alkyl or alkenyl radical containing from 12 to 18 carbon atoms, and (iv) a polyalkylene glycol which has a molecular weight of 200 to 4,000 and is soluble in water to the

extent of at least 5% by weight at 25° C., the polyester so obtained containing from 10% to 80%, by weight of residues of the polyalkylene glycol (iv), and the stated weight percentages of the components (a) and (b) respectively in the compositions being based upon the combined weights of those components.

6. A composition as claimed in claim **1**, wherein the polyester (a) or the polyester (b) is wholly or partially neutralised by treatment with one or more organic bases.

10. An emulsion of oil in an aqueous medium wherein there is present as surfactant from 0.5% to 50%, based on the weight of the oil phase, of a composition as claimed in any one of claims **1**, **6**, **8**, or **9**.

4,256,606

ARRANGEMENT FOR THE THERMAL REGENERATION OF CHARGED ACTIVE COKE OR ACTIVE CARBON GRANULATE

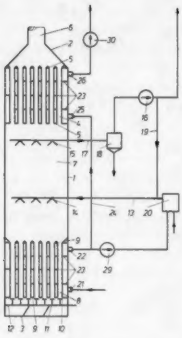
Rolf Noack, and Stefan Gramelt, both of Oberhausen, Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

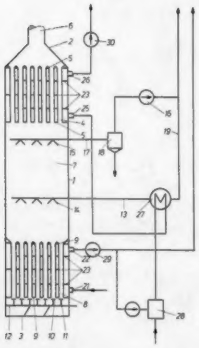
Filed Feb. 14, 1979, Ser. No. 12,033

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809567

Int. Cl.[3] **B01J** *20/34; C01B 31/08; F27B 1/08*

U.S. Cl. 252—411 R **9 Claims**





1. A process for thermal regeneration of charged activated coke or activated carbon granulate, comprising the steps of: preheating the granulate in a preheating zone; heating the granulate in a heating zone of a traveling bed by direct contact with a heated stream comprising a partial stream of desorption gas expelled from the granulate; and cooling the granulate in a cooling zone immediately after leaving the heating zone, the steps of preheating and cooling each being carried out by using a heat exchange medium separate from the heated stream in the heating zone, said charged granulate being heated to desorption temperature in said heating zone by direct contact with a gaseous heat-exchange medium.

8. A process as defined in claim **1**, including the steps of guiding the granulate in the preheating zone and the cooling zone through substantially vertical channels; guiding the heat exchange medium externally around said channels, said heat exchange medium being guided first through the cooling zone and then through the preheating zone; using air as heat exchange medium; mixing hot gas generated in a combustion chamber to the partial stream of the desorption gas before entry into the heating zone, a partial stream of cool air leaving the cooling zone being supplied as combustion air to the combustion chamber, the partial stream of desorption gas being heated indirectly in a heat exchanger with combustion gases of the combustion chamber; delivering said combustion gases after leaving said heat exchanger to the preheating zone; and supplying cool air flowing through the cooling zone as combustion air to said combustion chamber.

9. A process as defined in claim **1** wherein said gaseous heat-exchange medium is blown into said heating zone through a duct at substantially 550° C., said duct being connected with roof-shaped elements passing through a housing of said heating zone transversely and being open downwardly, said heat-exchange medium rising upwardly in counterflow to traveling direction of the granulate and heating said granulate, desorption gas expelled from the granulate during heating being caught through roof-shaped components together with said heat-exchange medium at a temperature of substantially 300° C. and drawn off through said duct, and separating entrained dust in said duct by a dust precipitator.

4,256,607

PROCESS FOR PRODUCTION OF ACTIVATED CARBON FIBERS

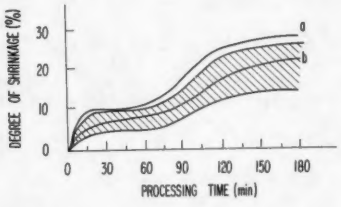
Masatoshi Yoshida, Mishima, and Minoru Hirai, both of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1977, Ser. No. 785,888

Claims priority, application Japan, Oct. 5, 1976, 51-118989

Int. Cl.[3] **B01J** *37/00*

U.S. Cl. 252—117 **16 Claims**



1. A process for producing activated carbon fibers of high adsorption capacity containing at least 3 wt% nitrogen calculated as elemental nitrogen which comprises oxidizing an acrylonitrile based fiber, wherein the acrylonitrile based fiber is a homopolymer of acrylonitrile, a copolymer containing about 60% by weight or more of acrylonitrile, or a mixture of polymers such that about 60% by weight or more of acrylonitrile is present in the mixture, in an oxidizing atmosphere at a temperature of about 200° C. to about 300° C. while applying a tension to the fiber until the amount of bonded oxygen reaches about 50% to about 90% of the saturated amount of bonded oxygen of the fiber, wherein the oxidizing is while applying tension in such a manner that the shrinkage of the fiber reaches about 50% to about 90% of the degree of free shrinkage at the same temperature, and then activating the fiber, wherein the activating is by heating the oxidized fiber in an activation gas selected from CO_2, NH_3 or steam at a temperature of about 700° C. to about 1,000° C. for 10 minutes to 3 hours while the fiber is

allowed to shrink freely, to thereby provide a specific surface area to said carbon fiber of from 300 m^2/g to 2,000 m^2/g.

4,256,608

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 18,811, Mar. 7, 1979, Pat. No. 4,210,524, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 1, 1979, Ser. No. 80,639

The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.[3] B01J *27/08, 27/10, 23/89*

U.S. Cl. 252—441 17 Claims

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation and pyrolysis of the rhenium carbonyl component, and of an iron component.

4,256,609

CATALYSTS

Robert W. Dale, and John J. Rooney, both of Belfast, Northern Ireland, assignors to Gallaher Limited, Belfast, Northern Ireland

Filed Jan. 17, 1979, Ser. No. 4,216

Claims priority, application United Kingdom, Jan. 20, 1978, 2391/78; May 26, 1978, 23527/78

Int. Cl.[3] B01J *29/04, 21/04*

U.S. Cl. 252—455 Z 20 Claims

1. A method of making a catalyst comprising physically adsorbing a substance providing a catalytically active metal selected from the group consisting of groups 6, 7, and 8 of the Periodic Table into a microporous support having an average pore diameter less than 30 Å by contacting the support with a solution of the substance in a solvent which is a mixture of water and an organic liquid which reduces the surface tension of the solution and which is inert to said substance, and evaporating at least some of the solvent and thereby depositing the said substance in the micropores.

3. A method according to claim 1 in which the support material is zeolite or alumina.

4. A method according to claim 1 in which the catalytically active material is selected from platinum, palladium and rhodium.

19. In a process for making a catalyst comprising depositing on a porous refractory support material a solution of a substance providing a catalytically active metallic material comprising a metal of groups 6, 7 or 8 of the Periodic Table and converting said substance to said catalytically active metallic material, the improvement comprising making a more active catalyst by using a microporous support material having an average pore diameter of less than 30 Å and physically adsorbing a solution of said substance in a mixture of water and 10 to 90% by volume of an inert organic liquid selected from the group comprising tetrahydrofuran, methanol, ethanol, dioxan and furan into said support material and evaporating at least 50% by volume of solvent, based on the volume of said solution, to thereby deposit said substance in the micropores of said support material.

4,256,610

CLEANING COMPOSITION FOR USE IN AN INK JET RECORDER

Ki-Sup Hwang, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 25, 1979, Ser. No. 42,679

Int. Cl.[3] C11D *3/60, 9/60*

U.S. Cl. 252—542 7 Claims

1. A cleaning composition for an ink jet recording system comprising:

a wetting agent selected from the group consisting of oleyl amino-oleate, octylphenoxypropyl ethoxy ethanol, disodium isodecyl sulfosuccinate, poly alkyl ethers, and mixtures thereof,

an electrostatic discharge agent comprising a monophosphate ester of an alkoxylated linear primary alcohol, which alcohol contains from 10 to 15 carbon atoms,

a viscosity and density adjusting agent selected from the group consisting of ethoxylated cellulose, tetraethylene pentamine, and mixtures thereof,

a pH adjusting agent capable of adjusting the pH of the composition to a range of between 7 and 10, and

water.

4,256,611

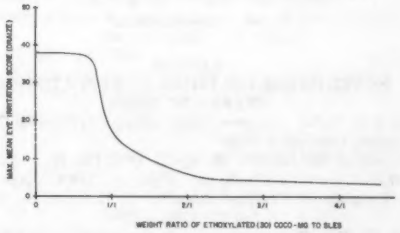
LIGHT DUTY NON-IRRITATING DETERGENT COMPOSITIONS

Richard R. Egan, Worthington, and Phillip L. Cotrell, Urbana, both of Ohio, assignors to Sherex Chemical Company, Inc., Dublin, Ohio

Continuation of Ser. No. 942,074, Sep. 13, 1978, which is a continuation-in-part of Ser. No. 795,342, May 9, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,835

Int. Cl.[3] C11D *1/12, 1/83*

U.S. Cl. 252—548 9 Claims



2. A low eye and skin irritant detergent composition comprising:

(a) an ethylene oxide adduct of a partial glycerol ester of a C_{10}–C_{18} fatty acid having a monoglyceride content of from about 15 to 45 wt. % with diglycerides essentially constituting the balance, said adduct prepared by reacting one mole of the partial glycerol ester per about 15 to 100 moles of ethylene oxide:

(b) anionic surface-active agent selected from the group of salt of higher alkyl sulfate or salt of higher alkyl ether sulfate or salt of higher alkyl benzene sulfonate; and

(c) an alkanolamide foam stabilizing agent;

wherein the weight ratio of (b) to (c) is about 4:1 to 5:1, respectively, and wherein the weight ratio of (a) to (b) is about 2:1 to 5:1, respectively.

4,256,612

PREPARATION OF EPOXY RESIN-RUBBER-GLASS MIXTURE AND MIXTURE PRODUCED

Harry C. Hopkins, 15 Lafayette St., White Plains, N.Y. 10606

Filed Jul. 23, 1979, Ser. No. 59,905
Int. Cl.³ C08L *7/00, 17/00, 63/00*
U.S. Cl. 260—2.3 **10 Claims**

1. A process for forming a rubber-glass mixture comprising the steps of

melting glass and rubber in separate vessels

mixing 20–80% by volume of the melted glass with the melted rubber to form a rubber-glass melt,

adding 0.5–1.5% epoxy resin to the melt,

stirring the melt to a uniform consistency, and allowing the melt to solidify in a desired shape.

4,256,613

COMPOSITION AND PROCESS FOR MAKING PRECIPITATED NYLON-CELLULOSE BICONSTITUENT COMPOSITION

Neal E. Franks, Suffern, N.Y., and Julianna K. Varga, Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 938,907, Sep. 1, 1978, Pat. No. 4,196,282, which is a continuation-in-part of Ser. No. 854,957, Nov. 25, 1977, Pat. No. 4,145,532. This application Jul. 2, 1979, Ser. No. 54,357
Int. Cl.³ C08L *1/02*
U.S. Cl. 260—13 **17 Claims**

1. A biconstituent dispersion comprising:

(A) a first distinct phase comprising a solution of

(1) a nylon having an amide group index of less than about 145,

(2) a tertiary amine oxide nylon solvent which has a N-methylamine oxide group endo or exo to an aromatic or a saturated or unsaturated ring and which has substantial stability at 125° C., and

(3) a nylon solubility enhancing amount of water from about 0.5% to about 11% by weight based upon the combined weight of (1), (2) and (3), and

(B) a second distinct phase comprising a solution of

(1) cellulose

(2) a tertiary amine oxide cellulose solvent, and

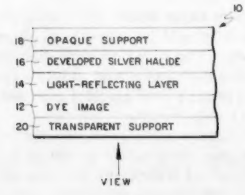
(3) a cellulose solubility enhancing amount of water.

4,256,614

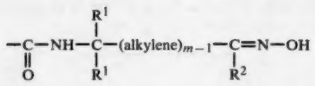
NOVEL OXIME POLYMERS AND PROCESS FOR PREPARING SAME

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 894,545, Apr. 7, 1978, Pat. No. 4,202,694, which is a continuation-in-part of Ser. No. 789,422, Apr. 21, 1977, abandoned. This application Nov. 5, 1979, Ser. No. 91,067
Int. Cl.³ C08L *1/28*
U.S. Cl. 260—17 A **14 Claims**



1. A polymer having at least one substituent of the formula



wherein R^1 is alkyl having 1–6 carbon atoms; the alkylene moiety has 1–8 carbon atoms; R^2 is hydrogen, amino, phenyl or alkyl of 1–4 carbon atoms; and m is 1 or 2, said polymer having a molecular weight of at least 100,000.

4,256,615

ADHESIVE CONSISTING ESSENTIALLY OF A RICINOLEATE URETHANE POLYOL AND A CHLORINATED RUBBER

Legue, Norris R., Scotch Plains, N.J., assignor to Synthetic Surfaces, Inc., Scotch Plains, N.J.

Filed May 7, 1979, Ser. No. 36,359
Int. Cl.³ C08G *18/04;* **C09J** *3/12, 3/16*
U.S. Cl. 260—18 TN **30 Claims**

1. An adhesive composition consisting essentially of a solution in a suitable solvent of

(a) a ricinoleate urethane polyol, and

(b) a chlorinated rubber having approximately 63% to 68% by weight chlorine and appearing in quantities no greater than approximately 70% by weight of the combined polyol and rubber.

4,256,616

PLATINUM COMPLEXES FOR SILICONE COMPOSITIONS

Masayuki Hatanaka, 91-8, Shin-Nakano, Ohra-machi, Ohra-gun, Gumma-ken, and Shigeru Nagashima, 1550, Menuma-machi, Ohsato-gun, Saitama-ken, both of Japan

Filed Nov. 22, 1978, Ser. No. 962,869
Int. Cl.³ C08L *91/00*
U.S. Cl. 260—18 S **6 Claims**

1. A silicone composition which is capable of being vulcanized at room temperature or at elevated temperatures comprising: (a) 100 parts by weight of a vinyl-containing diorganopolysiloxane polymer having a polymerization degree varying from 100 to 10,000 at 25° C. and a viscosity of from 500 centipoise to 300,000,000 centipoise at 25° C. where the organo groups other than vinyl are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals; (b) a silicon-bonded-hydrogen containing polysiloxane having a viscosity varying anywhere from 5 to 5,000 centipoise at 25° C., and where the organo groups in such hydrogen containing polysiloxane are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals; (c) from 0.0001 to 0.2 parts by weight of a zero valent platinum-phosphorus complex having the formula $(R^1R^2R^3P)_4Pt$ wherein R^1, R^2 and R^3 are identical or different groups selected from the class consisting of monovalent hydrocarbon radicals and monovalent hydrocarbonoxy radicals and mixture thereof, and from 0.1 to 20 parts by weight of a stannous salt selected from the group consisting of stannous halides and stannous carboxylates per one part by weight of the zero valent platinum-phosphorus complex.

3. The composition of claim 1 wherein the stannous salt in (c) is selected from the class consisting of hydrates of stannous chloride, hydrates of stannous bromide, stannous octoate, stannous oleate, and stannous maleate.

4,256,617

CATALYZED NON-TOXIC POLYURETHANE FORMING COMPOSITIONS AND SEPARATORY DEVICES EMPLOYING THE SAME

Thaddeus F. Kroplinski, Old Bridge, and Barton C. Case, Hightstown, both of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Nov. 1, 1979, Ser. No. 90,206
Int. Cl.[3] C08G *18/16*
U.S. Cl. 260—18 TN 11 Claims

1. In a two component polyurethane forming composition which is non-toxic when cured and employed as a potting agent in a separatory device capable of use in a biomedical application wherein the first component comprises at least one NCO-terminated prepolymer and the second component comprises at least one polyol, wherein the improvement comprises including an effective catalytic amount of unreacted ricinoleic acid into said second component prior to curing above that amount of ricinoleic acid inherently present in the polyol.

4,256,618

ANTIMONY MERCAPTOCARBOXYLIC ACID OR ESTER-MERCAPTOCARBOXYLIC ACID ESTER STABILIZERS FOR RIGID POLYVINYL CHLORIDE RESIN COMPOSITIONS

Lawrence R. Brecker, Brooklyn, and Charles Keeley, Wantagh, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jan. 24, 1979, Ser. No. 5,931
Int. Cl.[3] C08L *91/00*
U.S. Cl. 260—23 XA 27 Claims

1. A stabilizer composition capable of enhancing the resistance to the development of early discoloration in the first five to twenty minutes of heating at 190° C. of rigid polyvinyl chloride resin compositions, comprising an antimony mercaptocarboxylic acid or ester and a mercaptocarboxylic acid ester in the proportion of an amount within the range from about 25 to about 90 parts by weight antimony mercaptocarboxylic acid or ester and an amount within the range from about 75 to about 10 parts by weight mercaptocarboxylic acid ester, the amount of mercaptocarboxylic acid ester being selected within these ranges to synergize the stabilizing effectiveness of the antimony mercaptocarboxylic acid or ester.

4,256,619

OIL-MODIFIED RESINS, PROCESS FOR PREPARATION THEREOF, AND A COMPOSITION FOR PRINTING INK CONTAINING SAID OIL-MODIFIED RESINS AS VEHICLE COMPONENTS

Akinori Miyaguchi, Yokohama; Yasuomi Morita, Samukawa, and Yasuyoshi Chino, Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd. and Morimura-Chemerion Ltd., both of Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,569
Claims priority, application Japan, Sep. 18, 1978, 53-114391
Int. Cl.[3] C09D *3/727, 3/733, 11/10*
U.S. Cl. 260—23.7 C 30 Claims

1. A process for producing an oil-modified resin having a softening point of 40° to 200° C., which comprises reacting [A] an acid-modified cyclopentadiene resin having an acid value of 0.1 to 100 in the presence of [C] at least one metal compound selected from the group consisting of polyvalent metal alcoholates and chelate compounds thereof with [B] an oily modifier containing at least 4 carbon atoms and having a functional group capable of reacting with the metal compound [C], said acid-modified cyclopentadiene resin being selected from the group consisting of (i) the reaction product of 100 parts by weight of a cyclopentadiene resin free from a carboxyl or acid anhydride group, 0 to 200 parts by weight of a higher fatty acid ester containing a conjugated double bond and 0.2 to 50 parts by weight of an α,β-unsaturated dicarboxylic compound, (ii) a cyclopentadiene resin containing a carboxyl or acid anhydride group, and (iii) the reaction product of 100 parts by weight of a cyclopentadiene resin having a carboxyl or acid anhydride group, 0 to 200 parts by weight of a higher fatty acid ester having a conjugated double bond, and 0 to 50 parts by weight of an α,β-unsaturated dicarboxylic compound.

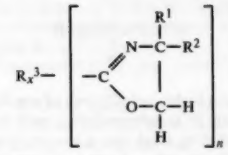
4,256,620

USE OF LOW MOLECULAR WEIGHT OXAZOLINES AS NEUTRALIZING AGENTS FOR ANIONIC WATER-DILUTABLE RESINS

Hansjörg Aigner; Klaus Behmel, and Johann Luttenberger, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jun. 14, 1976, Ser. No. 695,850
Claims priority, application Austria, Jun. 17, 1975, 4649/75
Int. Cl.[3] C08L *61/20, 33/00*
U.S. Cl. 260—29.6 HN 13 Claims

1. Method of forming an aqueous solution of an anionic resin including neutralizing said resin with low molecular oxazoline compounds of the formula



wherein n is an integer of from 1 to 4, R^1 and R^2 are each the same or different monovalent radicals of aliphatic, cycloaliphatic, aromatic, or heterocyclic hydrocarbons, and R^3 is a radical with a molecular weight of below 500, containing the same groups as R^1 and R^2, and x is equal to n or zero, n being 2 when x is zero.

4,256,621

PAINT COMPOSITION FOR CATHODIC ELECTRODEPOSITION

Katzujiro Shimokai, Chiba; Masayuki Kataoka, Ichihara, and Akihiko Funamoto, Abiko, all of Japan, assignors to Nippon Soda Company, Ltd., Ohtemachi, Japan

Filed Aug. 15, 1979, Ser. No. 66,580
Claims priority, application Japan, Sep. 8, 1978, 53-109670
Int. Cl.[3] C08L *9/10, 13/02*
U.S. Cl. 260—29.7 NR 4 Claims

1. A paint composition for cathodic electrodeposition in the form of an aqueous solution or dispersion essentially comprising a resin product prepared by:

(a) first, reacting a maleated conjugated diene polymer as an addition reaction compound of a maleic anhydride with a homopolymer, a random copolymer, a block copolymer or a draft copolymer of a conjugated diene selected from the group consisting of 1,3-butadiene, isoprene, 1,3-pentadiene, chloroprene and cyclopentadiene, said homopolymer or copolymer of conjugated diene having a number average molecular weight of 200 to 100,000, with, an alcohol, having a tertiary amino group or a mixture of said alcohol and a monohydroxy compound having 1 to 18 carbon atoms to obtain a semi-esterified first product;

(b) second, reacting said first product with an epoxy resin having two equivalents or more of epoxy groups to one equivalent of carboxyl group in said first product to obtain a second product;

(c) third, reacting said second product with a primary or secondary amine to obtain a resultant third product; and,

(d) finally reacting said third product with a partially blocked polyisocyanate having intramolecularly two or less of free isocyanate groups and one or more of blocked isocyanate groups in one molecule to obtain a final resultant resin product, and further neutralizing said resultant

resin product with an acid to render said resultant resin product soluble or dispersible in water.

4,256,622

CURABLE HYDROXY RESIN COMPOSITIONS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 897,321, Apr. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 845,188, Oct. 25, 1977, abandoned. This application Jan. 7, 1980, Ser. No. 110,048

Int. Cl.[3] **C08K** *5/06;* **C08L** *63/02, 61/10, 61/28*

U.S. Cl. 260—33.2 R **16 Claims**

1. A curable composition comprising:

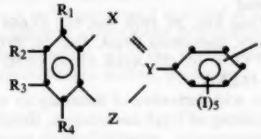
(A) 100 parts by weight of a non-aminoplast hydroxyl-bearing polymer capable of curing with an aminoplast or phenolic resin which represents x-hydroxyl equivalents;

(B) about 5 to about 100 parts by weight which represents y-hydroxyl equivalents of a (poly)glycol monoether represented by the formula:

$$RO\text{-}\left(CH_2CHO\right)_n\text{-}H$$
$$\quad\quad\quad

A-B-C

wherein A is a group having the structure



wherein

X is a nitrogen atom;

Y is a carbon atom;

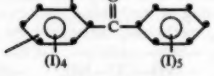
Z is a sulfur atom, a nitrogen atom, or a nitrogen atom containing a hydrogen atom or an alkyl group having 1 to 12 carbon atoms or an aryl or substituted aryl group having 6 to 18 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, hydroxyl, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, said B connecting group is attached to the benzenoid ring in the ortho, meta or para positions from the carbon atom connected to the Y substituent, said I substituents can all be the same substituent listed above or different listed substituents;

B is a linking group connecting A and C and can be alkylene, arylene, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyl, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, alkyloxyphosphinylidene, aryloxyphosphinylidene, oxy(alkyl)phosphinyloxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-arylaminocarbonyl, N-alkylaminocarbonyl, N,N-diarylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; and

wherein C is a hydroxybenzophenone group having the formula



where I is the same substituent as listed above and is present in all positions of the benzoid rings except the carbon atom attached to the B group connecting the A and C moieties, said B connecting group is attached to the benzenoid ring in the ortho, meta or para position from the keto group of the benzophenone, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,256,627

NOVEL LIGHT STABILIZERS FOR PLASTICS

Paul Moser, Riehen; Jean Rody, Basel, and Friedrich Karrer, Zofingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

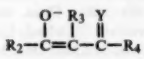
Filed Nov. 1, 1978, Ser. No. 956,716

Claims priority, application Switzerland, Nov. 8, 1977, 13587/77

Int. Cl.³ C08K *5/34, 5/35, 5/09*

U.S. Cl. 260—45.75 N 23 Claims

1. A stabiliser mixture of (a) a linear polymer which contains polyalkylpiperidine residues chemically bonded in any form and (b) a metal compound of the formula MeL_2, in which Me is nickel or cobalt, L is an enolate ion of the formula



in which Y is oxo or NR_6 wherein R_6 is C_1–C_{12} alkyl, cyclohexyl, benzyl, phenyl, naphthyl or tolyl, R_2 is C_1–C_{12} alkyl or phenyl and R_3 is hydrogen or R_2 and R_3 together are 1,4-butadienylene or 1,4-butadienylene substituted by alkyl of 1–4 carbon atoms and R_4 is C_1–C_{12} alkyl or C_1–C_{12} alkoxy, the weight ratio of component (a) to component (b) being 99.9:0.1 to 10:90.

23. A plastic stabilised against the action of light, which contains 0.01 to 5% by weight, calculated relative to the plastic to be stabilised, of a stabiliser mixture according to claim 1.

4,256,628

SULFUR-FREE ACIDULATION OF TALL OIL SOAP

Dan C. Tate, Canton, N.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 17, 1980, Ser. No. 112,926

Int. Cl.³ C09F *1/02*

U.S. Cl. 260—97.7 6 Claims

1. In a method for the conversion of tall oil soap to tall oil comprising acidulating the tall oil soap, permitting the resulting reaction mixture to settle to form a tall oil layer, a lignin layer and a spent acid or brine layer and recovering the tall oil layer, the improvement which comprises acidulating the tall oil soap by contacting said soap with boron trifluoride or a sulfur-free complex thereof.

4,256,629

ANTIGEN FOR EARLY PREGNANCY TEST AND CONTRACEPTIVE VACCINE

Om P. Bahl, Williamsville, N.Y., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 875,497, Feb. 6, 1978. This application Apr. 17, 1979, Ser. No. 30,771

Int. Cl.³ A61K *39/385, 39/395, 39/44;* C07G *7/00*

U.S. Cl. 260—112 B 21 Claims

1. An antigen which is capable of being administered to a host animal to induce an antibody response which is generally selective to human chorionic gonadotropin to a distinguishing degree from luteinizing hormone, which comprises a β-subunit of human chorionic gonadotropin which has been reduced such that six of the intrachain disulfide bonds are cleaved, and wherein said cleaved disulfide bonds have been alkylated, and wherein said subunit is further conjugated with a protein or a hapten which functions to enhance the antibody response to said antigen when said antigen is administered to said host animal.

20. An antibody comprising an antiserum coated on a solid support generally selective in reactivity to hCG to a distinguishing degree from LH wherein said antibody is produced by the process which comprises:

isolating the β-subunit of human chorionic gonadotropin, reducing and cleaving six of the intrachain disulfide bonds

of said β-subunit, and alkylating the thus reduced intrachain disulfide groups,

isolating said antigen,

administering said antigen to a host animal wherein said animal generates an antibody response to said antigen, extracting said antiserum from said animal, and coating said antiserum on a solid support.

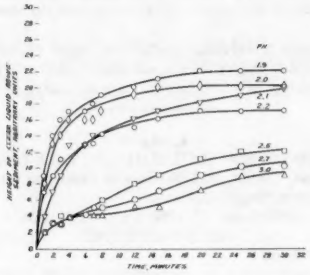
4,256,630
ACTIVATED SLUDGE TREATMENT

Henry A. Fremont, Wyoming, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 752,261, Dec. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 633,122, Nov. 18, 1975, abandoned. This application May 29, 1979, Ser. No. 43,359

Int. Cl.³ C02F *11/14*

U.S. Cl. 260—112 R **10 Claims**



1. The method of treating an activated sludge from a municipal or a pulping operating or combination thereof, comprising the steps of acidifying the sludge to a pH below about 2.2, heating the acidified sludge to a temperature of from about 150°–210° F. and maintaining the sludge at such conditions for a period of time sufficient to obtain a settling rate of solids in the first three minutes of at least two-sixteenths inch per minute to facilitate dewatering.

4,256,631
PROCESS FOR THE PREPARATION OF IMMUNOGLOBULIN FOR INTRAVENOUS ADMINISTRATION

Nobuo Yokoo, Sayama, and Toshihito Mori, Higashimurayama, both of Japan, assignors to Kowa Company, Limited, Aichi, Japan

Filed Mar. 18, 1980, Ser. No. 131,539

Claims priority, application Japan, Mar. 22, 1979, 54/33477

Int. Cl.³ A23J *0/00*

U.S. Cl. 260—112 B **5 Claims**

1. A process for the preparation of immunoglobulin for an intravenous administration comprising purifying an immunoglobulin by a combination, in an arbitrary order, of a fractional precipitation method in which one or more divalent or trivalent metal salts are added to an aqueous solution of the immunoglobulin and the supernatant is collected, and an affinity chromatography using as an adsorbent a complex of human IgG and a polyhydroxy polymeric compound.

4,256,632
NOVEL DERIVATIVES OF DAUNOMYCIN

Yehuda Levin, Tel Aviv, and Ben-Ami Sela, Rehovot, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Aug. 20, 1979, Ser. No. 67,664

Claims priority, application Israel, Aug. 24, 1978, 55431

Int. Cl.³ C07C *103/52*; A61K *37/00*; C07G *11/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. An amino acid derivative of daunomycin selected from the group consisting of lysyl daunomycin, $(lysyl)_2$-daunomycin, $(lysyl)_3$-daunomycin, aspartyl-lysyl-daunomycin, $(ornithyl)_2$-daunomycin, $(ornythyl)_5$-daunomycin, arginyl-daunomycin, diaminobutyryl-daunomycin, dihydroxyphenylalanine-daunomycin, histidyl-daunomycin, lysyl-lauryl-daunomycin, lysyl-phenylalanyl daunomycin and prolyl daunomycin.

4,256,633
CHROMIUM COMPLEX COMPOUNDS, PROCESS FOR THEIR MANUFACTURE AND USE THEREOF

Fabio Beffa, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

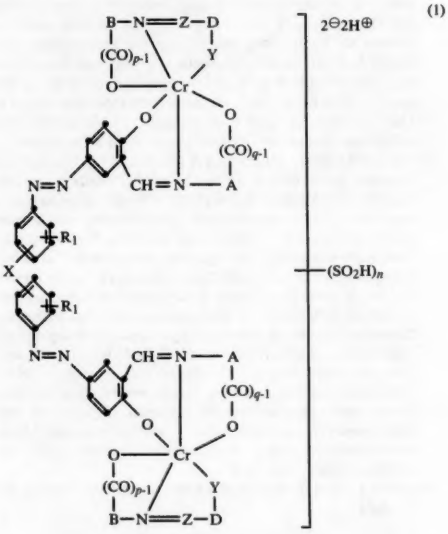
Filed Apr. 16, 1979, Ser. No. 30,413

Claims priority, application Switzerland, Apr. 25, 1978, 44482/78; Dec. 5, 1978, 123965/78

Int. Cl.³ C09B *45/26*

U.S. Cl. 260—145 C **11 Claims**

1. A chromium complex compound which, in the form of the free acid, has the formula



wherein X is a direct bond or a bridge member selected from the group consisting of methylene, methylene substituted by C_1- to C_5-alkyl, methylene substituted by phenyl, —O—, —S—, —NR′—, —SO—, —SO_2—, —CO—, —CO—CO—, —CO—HN—, —NH—CO—NH, —NH—CS—NH—, —SO_2NH—, —SO_2—, —N═N—, —CH_2—CH_2— and —CH═CH—, wherein R′ is hydrogen or C_1- to C_5-alkyl; Z is a nitrogen atom or a —CH— group; each of p and q is independently 1 or 2; Y is an oxygen atom or a group of the formula —NR—, wherein R is hydrogen or C_1 to C_5-alkyl, with the proviso that, if Z is a —CH— group, Y must be an oxygen atom; R_1 is hydrogen, sulfo, carboxy, halogen, C_1- to C_5-alkyl or C_1- to C_5-alkoxy; B is a benzene or naphthalene radical; D is the radical of an o-hydroxy-aldehyde if Z is the —CH—

group, or, if Z is a nitrogen atom, D is the radical of a coupling component which is selected from the group consisting of phenols, naphthols, naphthyl-amines, pyrazolones, pyrazolimines, pyridones, acetoacetamides, barbituric acids and oxyquinolines; n is an integer from 2 to 8; and A is a benzene or naphthalene radical or a substituted or unsubstituted aliphatic or cycloaliphatic radical, with the proviso that, if A is an aliphatic or cycloaliphatic radical, q must be 2.

4,256,634

IRON COMPLEX AZO DYESTUFFS

Hermann Goebel, and Kurt Eitel, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

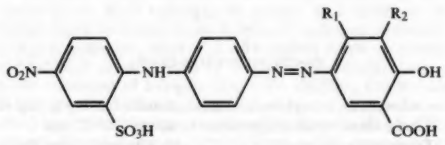
Filed Feb. 16, 1979, Ser. No. 12,947

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2806950

Int. Cl.[3] **C09B** *45/14*

U.S. Cl. 260—149 **2 Claims**

1. Iron complexes of azo dyestuffs of the formula



wherein

R_1=H, SO_3H or alkyl and

R_2=H or alkyl

4,256,635

OPTIONALLY FURTHER SUBSTITUTED 5-(2'- OR 4'-PHENOXYPHENYLAZO)-6-HYDROXYPYRIDONE-2 COMPOUNDS CONTAINING A CATIONIC GROUP IN THE 1-POSITION

Manfred Greve, Dornach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

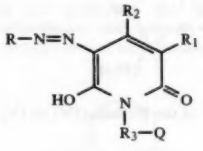
Continuation of Ser. No. 780,757, Mar. 24, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,329

Claims priority, application Switzerland, Mar. 30, 1976, 3957/76

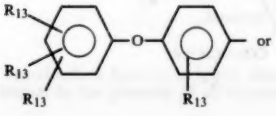
Int. Cl.[3] **C07C** *107/04;* **C09B** *44/08*

U.S. Cl. 260—156 **31 Claims**

1. A compound of the formula



wherein R is



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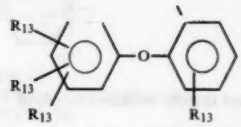


wherein

each R_{13} is independently hydrogen or halo, with the proviso that at least one R_{13} is halo,

R_1 is hydrogen, cyano, —COR_4 or —$CONR_5R_6$,

wherein

R_4 is C_{1-4}alkyl or phenyl,

R_5 is hydrogen, C_{1-4}alkyl or phenyl, and

R_6 is hydrogen or primary or secondary C_{1-4}alkyl,

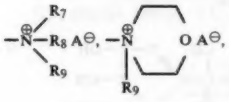
R_2 is hydrogen, C_{1-4}alkyl, phenyl, benzyl or phenylethyl,

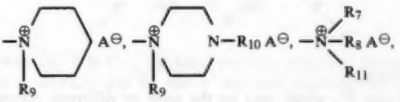
R_3 is straight or branched C_{2-8}alkylene, straight or branched C_{2-8}alkenylene or -AlK-O-Alk-,

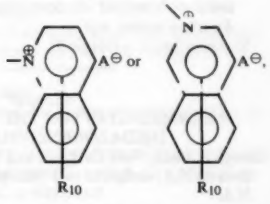
wherein

each Alk is straight or branched alkylene or alkenylene, with the provisos that the two Alk radicals together contain no more than 8 carbon atoms and not more than one Alk radical is straight or branched alkenylene, and

Q is







wherein

each of R_7 and R_8 is independently C_{1-8}alkyl,

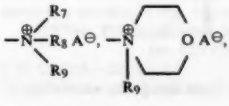
R_9 is C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by halo, C_{1-4}alkoxy, (C_{1-4}alkyl)carbonyl or benzoyl,

R_{10} is hydrogen or C_{1-4}alkyl,

R_{11} is benzyl or benzyl having 1 to 3 substituents selected from halo and C_{1-4}alkyl on its phenyl ring, and

$A^{\ominus}$ is an anion,

with the provisos that three of the R_{13}'s are halo and one R_{13} is hydrogen when Q is



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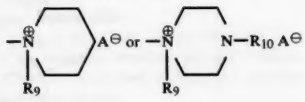
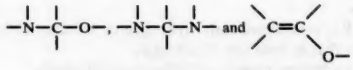


and that the molecule is free of



radicals.

4,256,636

AZO-DI-ISOBUTYRIC ACID-(N,N-HYDROXYALKYL)-AMIDINES

Ernst Roos; Herbert Bartl, both of Odenthal; Klaus Schuster, Leverkusen, and Adolf Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

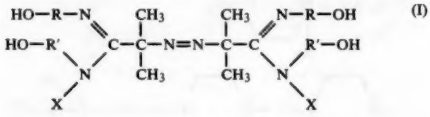
Filed Sep. 17, 1979, Ser. No. 76,235

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841045; Sep. 21, 1978, 2841046

Int. Cl.³ C07C *123/00*

U.S. Cl. 260—192 **7 Claims**

1. An azo-di-isobutyric acid-(N,N'-hydroxyalkyl)-amidine corresponding to the formula (I):



(I)

in which

R and R', which may be the same or different, represent linear or branched alkylene radicals containing from 2 to 4 carbon atoms, and

X represents R'—OH or H.

4,256,637

INTERMEDIATES FOR THE PRODUCTION OF IMIDAZOBENZODIAZEPINES

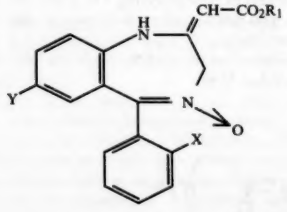
George F. Field, West Caldwell, and William J. Zally, Creskill, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 105,823, Dec. 20, 1979. This application Jul. 7, 1980, Ser. No. 166,716

Int. Cl.³ C07D *243/16*

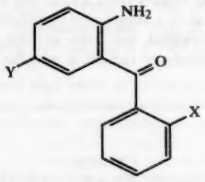
U.S. Cl. 260—239 BD **1 Claim**

1. A process to produce a compound of the formula



wherein X and Y are selected from the group consisting of hydrogen, halogen and trifluoromethyl and R_1 is hydrogen or lower alkyl which comprises:

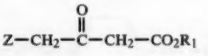
(A) reacting a compound of the formula



wherein X and Y are as above with a hydroxylamine salt at from 0° C. to about 200° C. and thereafter reacting the resultant product with a lower alkyl ketone in the presence of a copper salt at from about room temperature to reflux temperature

(B) reacting the product of (A) with water in the presence of a dilute strong acid at from about 0° C. to about 80° C.

(C) reacting the product (A) or (B) with a compound of the formula



wherein R_1 is as above and Z is a suitable leaving group at from about room temperature to about 120° C. and

(D) reacting the product of (C) with a base at from about −10° C. to about 100° C.

4,256,638

PROCESS FOR MANUFACTURE OF 9-AMINO-9-DEOXYCLAVULANATES

Roger J. Ponsford, Dorking, and Thomas T. Howarth, Ewhurst, both of England, assignors to Beecham Group Limited, Great Britain

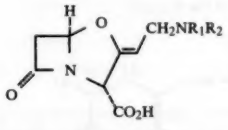
Division of Ser. No. 731,928, Oct. 13, 1976, abandoned. This application Sep. 14, 1978, Ser. No. 942,156

Claims priority, application United Kingdom, Oct. 13, 1976, 41887/76

Int. Cl.³ C07D *498/04;* C07B *29/00*

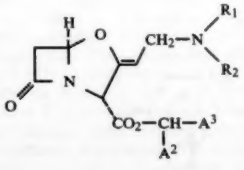
U.S. Cl. 260—245.3 **17 Claims**

1. A process for the production of a compound of the formula (II):



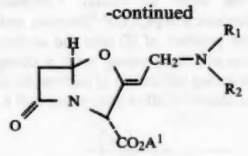
(II)

or an ester thereof of the formula (IV) or (V):



(IV)

-continued



(V)

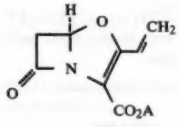
wherein A^1 is alkyl of 1–8 carbon atoms unsubstituted or substituted by halogen or a group of the formula OA^4, $OCOA^4$, SA^4 or SO_2A^4 wherein A^4 is a hydrocarbon of up to 6 carbon atoms; A^2 is hydrogen, alkyl of up to 4 carbon atoms or phenyl unsubstituted or substituted by halogen or by A^5 of OA^5 wherein A^5 is alkyl of up to 6 carbon atoms; and A^3 is phenyl unsubstituted or substituted by halogen or by A^5 of OA^5 wherein A^5 is as above defined; and wherein R_1 and R_2 are each independently a group of the sub-formula (a) (b) or (c):

(a) $—CR_4R_5R_6$

(b) $—CR_8R_9—C(R_{10})=CR_{11}R_{12}$

(c) $—CR_8R_9—CH(R_{10})—CHR_{11}R_{12}$

wherein R_4 is hydrogen; R_5 is hydrogen or alkyl of 1–4 carbon atoms; R_6 is phenyl unsubstituted or substituted by a substituent selected from the group consisting of halogen, OH, OR_7, $OCOR_7$, and COR_7, wherein R_7 is a hydrocarbon of up to 7 carbon atoms; R_8 is hydrogen or methyl; R_9 is hydrogen or methyl; R_{10} is hydrogen or methyl; R_{11} is hydrogen or methyl; or R_{12} is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl unsubstituted or substituted by a substituent selected from a group consisting of halogen, OH, OR_7, $OCOR_7$, CO_2R_7 and COR_7 wherein R_7 is a hydrocarbon of up to 7 carbon atoms which comprises reacting an amine of the formula HN_1R_2 (III) wherein R_1 and R_2 are as above defined, with a compound of the formula (X):



(X)

wherein CO_2A is an ester as above defined and in the case of the acid, hydrogenating the ester produced to the corresponding acid.

4,256,639

PROCESS FOR THE SYNTHESIS OF ISATIN DERIVATIVES

Leandro Baiocchi, Rome, Italy, assignor to Aziende Chimiche Riunite Angelini Francesco, Rome, Italy

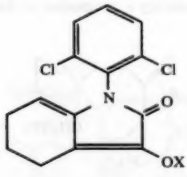
Filed Jun. 5, 1979, Ser. No. 45,792

Claims priority, application Italy, Jun. 23, 1978, 24917 A/78

Int. Cl.³ C07D *209/34, 209/38;* **C07C** *99/06*

U.S. Cl. 260—325 R **2 Claims**

1. A method for preparing the lactam of 2-(2,6-dichloroanilino)-phenylacetic acid wherein 4,5,6,7-tetrahydro-N-(2,6-dichlorophenyl)-isatin of the formula:



wherein X is hydrogen, lower alkanoyl or lower alkyl, is heated in the presence of an organic or inorganic acid and pyridine, quinoline or lutidine, and the resulting product is purified by crystallization.

4,256,640

TETRAHYDROTHIOPYRANO[2,3-b]INDOLE DERIVATIVES

Yasuo Makisumi; Susumu Takada, both of Kawanishi; Takashi Sasatani, and Natsuki Ishizuka, both of Sakai, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

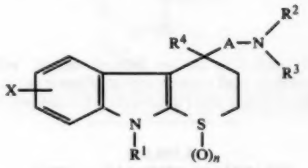
Filed May 15, 1979, Ser. No. 39,382

Claims priority, application Japan, May 23, 1978, 53-61832

Int. Cl.³ C07D *573/14*

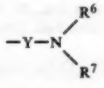
U.S. Cl. 260—326.12 A **29 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen, C_{1-6} alkyl, hydroxy C_{1-6} alkyl, C_{2-6} alkenyl, phenyl-C_{1-6} alkyl, phenyl, $-COR^5$ wherein R^5 is C_{1-6} alkyl, C_{2-6} alkenyl, phenyl or C_{1-6} alkoxy, or R^1 is



wherein Y is C_{1-6} alkylene, oxo-C_{1-6} alkylene, hydroxy C_{1-6} alkylene and R^6 and R^7 are each hydrogen or C_{1-6} alkyl;

R^2 is hydrogen or C_{1-6} alkyl;

R^3 is hydrogen, C_{1-6} alkyl, hydroxy-C_{1-6} alkyl, C_{2-6} alkenyl, phenyl-C_{1-6} alkyl, phenyl or di-C_{1-6} alkyl-amino-C_{1-6} alkyl;

R^4 is hydrogen or C_{1-6} alkyl;

A is methylene, C_{1-6} alkyl-methylene, ethylene or C_{1-6} alkylethylene;

X is hydrogen or one or two members selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy and halogeno-C_{1-6} alkyl; and

n is an integer of 0 to 2,

or a pharmaceutically acceptable salt of said compound.

4,256,641

NOVEL SYNTHESES OF TRYPTOPHANS

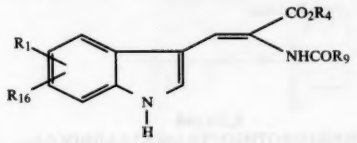
Andrew D. Batcho, North Caldwell; Urs O. Hengartner, Roseland; Willy Leimgruber, Montclair; John W. Scott, Upper Montclair, and Donald Valentine, Jr., Highland Park, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 965,549, Dec. 1, 1978, abandoned, which is a division of Ser. No. 849,734, Nov. 9, 1977, Pat. No. 4,140,697, which is a division of Ser. No. 698,573, Jun. 22, 1976, Pat. No. 4,073,795. This application Jul. 30, 1979, Ser. No. 62,214

Int. Cl.³ C07D *209/20*

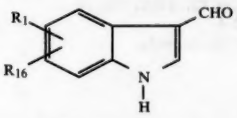
U.S. Cl. 260—326.14 T **5 Claims**

1. A process for preparing a compound of the formula:



XV

wherein R_1 and R_{16} each are halogen, lower alkyl, hydroxy, lower alkoxy, amino, trihalomethyl or hydrogen, R_4 is alkyl, and R_9 is lower alkyl, hydrogen, halo-lower alkyl or alkoxy, which comprises treating a compound of the formula:



XVII

wherein R_1 and R_{16} are as defined above; with lower acylamidomalonic acid mono(lower alkyl)ester in the presence of a base and a lower alkyl carboxylic acid anhydride.

4,256,642

PHARMACEUTICALLY ACTIVE 2,9-DIOXATRICYCLO[4,3,1,0^{3,7}] DECANES

Peter Willibrord Thies, Hanover, and Akiji Asai, Wennigsen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

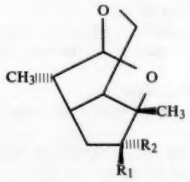
Division of Ser. No. 884,854, Mar. 9, 1978, Pat. No. 4,189,437, which is a division of Ser. No. 732,791, Oct. 15, 1976, Pat. No. 4,089,971. This application Jun. 25, 1979, Ser. No. 51,499

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547205

Int. Cl.^{3} C07D *319/14*

U.S. Cl. 260—340.3 **11 Claims**

1. A process for the preparation of 2,9-dioxatricyclo[4,3,1,0^{3,7}]decane of the general Formula I:



I

wherein one of R_1 and R_2 is hydrogen and the other is a hydroxy, acyloxy or carbamyloxy or R_1 and R_2 together denote oxygen comprising:

(a) reacting didrovaltratum or an extract containing didrovaltratum with halogen hydride to obtain 8-hydroxy-3-halomethyl-4-acetoxy-10-methylene-2,9-dioxatricyclo[4,3,1,0^{3,7}]decane;

(b) oxidizing the product of (a) to give the lactone of said product;

(c) converting said lactone with hydrogen on palladium/-charcoal to give 1-halomethyl-4-methyl-7-acetoxy-2-oxabicyclo[3,2,1]oct-3-en-8-carboxylic acid;

(d) reducing the product of (c) with a metal hydride to give the primary alcohol of said product;

(e) converting the product of (d) into 10-halo-10-methyl-3-halomethyl-4-acetoxy-2,9-dioxatricyclo[4,3,1,0^{3,7}]decane through oxidative cyclization by means of a halogen in a halogenated hydrocarbon;

(f) splitting off the halogens with hydrogen on Raney nickel in the presence of a strong base, while simultaneously hydrolyzing the ester to obtain 3,10-dimethyl-4-β-hydroxy-2,9-dioxatricyclo[4,3,1,0^{3,7}]decane; and

(g) converting the product of (f) into the acyloxy or carbamyloxy compound by treating with a compound selected from the group consisting of carboxylic anhydride, carboxylic acid chloride, alkyl isocyanate and a carbamic acid ester.

4,256,643

3-CHLORO-3-METHYL-BUTANE-1,4-DIAL-BIS-ACETALS AND 3-METHYL-BUT-2-ENE-1,4-DIAL-BIS-ACETALS, A PROCESS FOR THE PREPARATION OF THESE COMPOUNDS AND THEIR USE

Hagen Jaedicke, Ludwigshafen, and Joachim Paust, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

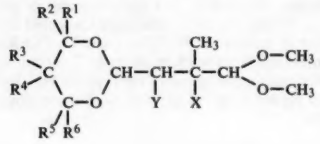
Filed Sep. 17, 1979, Ser. No. 76,412

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 2842715

Int. Cl.^{3} C07D *319/04*

U.S. Cl. 260—340.7 **3 Claims**

1. Chlorobutanedial-bis-acetals and butenedial-bis-acetals of the formula I



(I)

where R^1 to R^6 are H, $-CH_3$ or $-C_2H_5$ and Y is H if X is Cl (Ia) or Y and X together are a further bond between the carbon atoms bearing Y and X (Ib).

4,256,644

CHEMICAL INTERMEDIATES IN THE PREPARATION OF OXEPANE COMPOUNDS

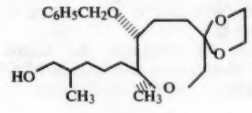
Michael P. Wachter, Bloomsbury, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 970,726, Dec. 18, 1978, Pat. No. 4,188,328. This application Jun. 29, 1979, Ser. No. 53,626

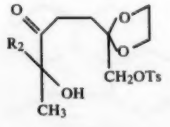
Int. Cl.^{3} C07D *317/00*

U.S. Cl. 260—340.9 R **16 Claims**

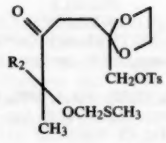
1. The process for the preparation of a compound of the formula



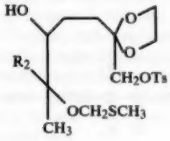
which comprises reacting a compound of the formula



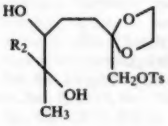
with dimethyl sulfoxide in an alkyl anhydride to form a compound of the formula



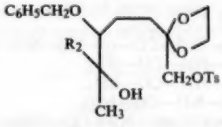
reacting the product formed with sodium borohydride to form a mixture of the erythro and threo alcohols of the formula



chromatographing the mixture over an adsorbent material to separate the isomers, reacting the erythro isomer with a mixture of mercuric chloride and calcium carbonate to form an erythro diol of the formula

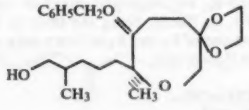


reacting the product with a benzyl halide to form an erythro benzyl ether of the formula

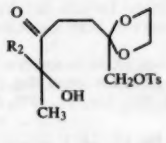


and reacting the product with a base in dimethyl sulfoxide wherein R_2 is $-(CH_2)_3CH(CH_3)CH_2OSi(C_6H_5)_2t\text{-}C_4H_9$; and wherein R_2 is $-(CH_2)_3CH(CH_3)CH_2OCH_2OCH_2CH_2OCH_3$ reacting the product with a base in dimethyl sulfoxide followed by reaction with zinc chloride; and wherein R_2 is $-(CH_2)_3C(CH_3)=CH_2$ reacting the product wth a base in dimethyl sulfoxide followed by reaction with borane methylsulfide.

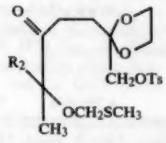
9. The process for the preparation of a compound of the formula



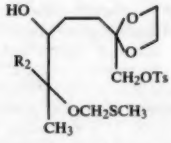
which comprises reacting a compound of the formula



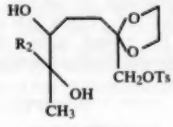
with dimethyl sulfoxide in an alkyl anhydride to form a compound of the formula



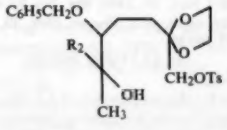
reacting the product formed with sodium borohydride to form an epimeric mixture of the erythro and threo alcohols of the formula



reacting said mixture with a mixture of mercuric chloride and calcium carbonate to form a product of the formula



reacting said product with a benzyl halide to form a mixture of compounds of the formula



chromatographing the mixture over an adsorbent material to separate the isomers and reacting the erythro isomer with a base in dimethyl sulfoxide, wherein R_2 is $-(CH_2)_3CH(CH_3)CH_2OSi(C_6H_5)_2t\text{-}C_4H_9$; and wherein R_2 is $-(CH_2)_3C(CH_3)-CH_2O-CH_2OCH_2CH_2OCH_3$ reacting the said product with a base in dimethyl sulfoxide followed by reaction with zinc chloride; and wherein R_2 is $-(CH_2)_3C(CH_3)=CH_2$ reacting the product with a base in dimethyl sulfoxide followed by reaction with borane methylsulfide.

4,256,645
PROCESS FOR PRODUCING GLUCONA-DELTA-LACTONE FROM GLUCOSE

Joji Nishikido; Nobuhiro Tamura, and Yohei Fukuoka, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1979, Ser. No. 75,457

Claims priority, application Japan, Sep. 14, 1978, 53/112361; Oct. 2, 1978, 53/120397; Nov. 17, 1978, 53/141215; Jan. 16, 1979, 54/2281

Int. Cl.³ C07D *309/30*

U.S. Cl. 260—343.5 **18 Claims**

1. A process for producing glucono-delta-lactone from glucose using an organic solvent by bringing glucose into contact with molecular oxygen in the presence of a palladium or platinum catalyst, wherein the organic solvent is selected from the group consisting of an ether, a nitrile, an alcohol, an amide, an ester, a ketone, a nitro compound, a pyridine base, a hydrocarbon and a halogenated hydrocarbon.

4,256,646
SYNTHESIS OF OPTICALLY PURE THROMBOXANES

Oscar Hernandez, Cary; John R. Bend; Thomas E. Eling, and James D. McKinney, all of Raleigh, N.C., assignors to The United States of America as represented by the Department of Health, Education, and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 920,392, Jun. 29, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,315

Int. Cl.³ C07D *309/22*

U.S. Cl. 260—345.8 P **2 Claims**

1. A process of producing compound 6 (methyl-2,3,4-trideoxy-6-O-trityl-4-methylcarboxymethyl-hex-2-enpyranoside) comprising reacting compound 1 (methyl-α-D-glucopyranoside) in the presence of Ph_3CCl and $4\text{-}Me_2Py$ and DMF to produce compound 2 (6-O-trityl-α-methylglucoside) and reacting compound 2 in the presence of $n\text{-}Bu_2SnO$, CH_3OH and BzCl, Et_3N, THF to produce compound 3 (methyl-2-O-benzoyl-6-O-trityl-α-D-glucopyranoside) and reacting compound 3 in the presence of MsCl and Et_3N, CH_2Cl_2 to produce compound 4 (methyl-2-O-benzoyl-3,4-di-O-methanesulfonyl-6-O-trityl-α-D-glucopyranoside) and reacting compound 4 in the presence of Zn-Cu, DMF and $CH_3O\text{-}Na/CH_3OH$ to produce compound 5 (methyl-3,4-dideoxy-6-O-trityl-hex-3-enpyranoside) and reacting compound 5 in the presence of $CH_3C(OCH_3)_3$, $C_2H_5CO_2H$ while refluxing xylenes to produce the desired compound 6 (methyl-2,3,4-trideoxy-6-O-trityl-4-methylcarboxymethyl-hex-2-enpyranoside).

4,256,647
PROCESS FOR THE PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURANE

Daniel Michelet, Tassin la Demi Lune, and Michel Rakoutz, Oullins, both of France, assignors to Philagro, Lyons, France

Filed Nov. 19, 1979, Ser. No. 95,445

Claims priority, application France, Nov. 30, 1978, 78 34296; Jul. 18, 1979, 79 19126

Int. Cl.³ C07B *307/86*

U.S. Cl. 260—346.22 **14 Claims**

1. In a process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofurane comprising heating a starting reagent of ortho-metallylpyrocatechol to effect the cyclization thereof, the improvement wherein said heating is carried out in the presence of water in the liquid phase in an amount sufficient to increase the yield of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofurane.

2. In a process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofurane comprising heating a starting reagent of ortho-metallyloxyphenol to effect rearrangement and cyclization thereof, the improvement wherein said heating is carried out in the presence of water in the liquid phase in an amount sufficient to increase the yield of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofurane.

4,256,648
19-HYDROXY-19-METHYL-4-OXO-PGI COMPOUNDS

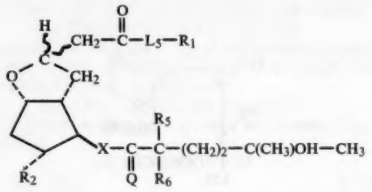
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,501. This application Mar. 3, 1980, Ser. No. 126,506

Int. Cl.³ C07D *307/935*

U.S. Cl. 260—346.22 **5 Claims**

1. A prostacyclin-type compound of the formula



wherein L_5 is
(1) $-(CH_2)_p-$, wherein p is 2, 3, or 4,
or (2) $-CH_2-CF_2-$,
wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is
(1) $-COOR_3$,
(2) $-CH_2OH$,
(3) $-CH_2N(R_7)(R_8)$,
(4) $-CO-N(R_7)(R_8)$,
(5) $-CO-NH-SO_2-R_{15}$, or
(6) tetrazolyl,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) $-CH_2-CO-R_{16}$,
wherein —(Ph)— is phenylene and —(Ph) is phenyl;
wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or

(4) —CH_2CH_2—.

4,256,649

SYNTHESIS OF OLEFINIC OXIDES FROM OLEFIN AND OXYGEN

Paul N. Dyer, Horsham, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 844,039, Oct. 20, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 923,280

Int. Cl.³ C07D *301/06*

U.S. Cl. 260—348.33 **4 Claims**

1. In a process for manufacturing an olefinic oxide which process comprises the steps of bringing an olefin and molecular oxygen into contact in the presence of a catalytic amount of a solution of a complex at temperatures of up to 200° C. and pressures up to 1000 psig, the improvement comprises selecting and dissolving in an organic liquid said complex from the group consisting of bis(tricyclohexylphosphine palladium dichloride; bis(tripentafluorophenyl)phosphine) palladium dichloride; bis(tri(pentafluorophenyl)phosphine)palladium; bis(-tricyclohexylphosphine) palladium; ethylene bis(tricyclohexylphosphine) palladium; and propylene bis(tri(pentafluorophenyl)phosphine) palladium.

4,256,650

PROCESS FOR PREPARING PROPYLENE OXIDE AND ACETIC ACID

Erna A. Bljumberg, Leninsky prospekt, 57, kv. 10; Sergei A. Maslov, Veshnyakovskaya ulitsa, 6, korpus 4, kv. 56; Nikolai M. Emanuel, Vorobievskoe shosse, 2b, kv. 44, all of Moscow; Alexandr G. Merzhanov, Noginsky raion, poselok Chernogolovka, ulitsa Pervaya, 1, kv. 30, and Inna P. Borovinskaya, Noginsky raion, poselok Chernogolovka, ulitsa Pervaya, 17/1, kv. 9, both of Moskovskaya oblast, all of U.S.S.R.

Continuation of Ser. No. 884,644, Mar. 8, 1978, abandoned. This application Jun. 8, 1979, Ser. No. 46,807

Int. Cl.³ C07D *301/06*

U.S. Cl. 260—348.33 **7 Claims**

1. A process for preparing propylene oxide and acetic acid comprising oxidizing propylene and acetaldehyde in the presence of an oxygen-containing gas in a liquid phase at a temperature within the range of from 70 to 100° C. under a pressure of from 40 to 50 atm in the presence of a boron compound catalyst of the formula BE selected from the group consisting of NB, TaB and MoB wherein E is tantalum, molybdenum or nitrogen.

4,256,651

2a,2b-DIHOMO-15-ALKYL-PGF$_{1\beta}$ COMPOUNDS

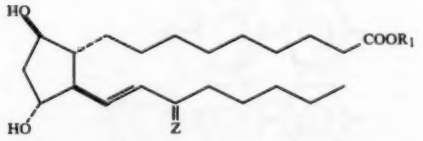
Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 3,152, Jan. 15, 1979, abandoned, which is a continuation of Ser. No. 884,431, Mar. 8, 1978, abandoned, which is a division of Ser. No. 663,362, Mar. 3, 1976, Pat. No. 4,082,783, which is a division of Ser. No. 551,220, Oct. 10, 1974, Pat. No. 3,974,195. This application Sep. 12, 1979, Ser. No. 74,695

Int. Cl.³ C07C *177/00*

U.S. Cl. 260—410.9 R **4 Claims**

1. An optically active compound of the formula



wherein Z is α—CH_3:β—OH or α—CH_2CH_3:β—OH; and wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive,

—(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,

—(p-Ph)—NH—CO—(p-Ph),

—(p-Ph)—NH—CO—CH_3,

—(p-Ph)—NH—CO—NH_3,

—(p-Ph)—CH=N—NH—CO—NH_2,

—p-naphthyl, wherein p-Ph is para-substituted phenyl or p-phenylene, or pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,256,652

PLATINUM COMPLEX

Yoshinori Kidani, 2-1, Mataho-cho, Nishi-ku, Nagoya-shi, Aichi-ken, Japan, and Masahide Noji, Nagoya, Japan, assignors to Yoshinori Kidani, Aichi, Japan

Division of Ser. No. 941,559, Sep. 12, 1978. This application Jun. 8, 1979, Ser. No. 46,628

Claims priority, application Japan, Sep. 12, 1977, 52/108921

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **1 Claim**

1. Cis-Pt(II)(trans-l-1,2-diaminocyclohexane)SO_4.

4,256,653

PREPARATION AND USE OF HIGH SURFACE AREA TRANSITION METAL CATALYSTS

Gary B. Atkinson, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 738,201, Nov. 3, 1976, Pat. No. 4,071,473. This application May 27, 1977, Ser. No. 801,442

Int. Cl.³ C07C *1/04*

U.S. Cl. 260—449.6 M **5 Claims**

1. A method for production of methane comprising reacting carbon monoxide and hydrogen at a temperature of about 350° to 400° C. and a pressure of about 1 to 100 atmospheres in the presence of a catalyst prepared by (a) forming an alloy of a first metal selected from the group consisting of nickel, cobalt, iron and mixtures thereof with a second metal selected from the group consisting of yttrium, the rare earth metals and mixtures thereof, said first metal comprising from 5 to 95 weight percent of said alloy, (b) reacting said alloy with a gas comprising hydrogen and carbon monoxide at a temperature of about 300° to 600° C. for a time sufficient to substantially completely oxidize said second metal and (c) reacting the thus-formed catalytically active product with a gas comprising hydrogen and carbon monoxide at a temperature below about 250° C. and a pressure of about 5 to 10 atmospheres for a time sufficient to enhance its catalytic activity.

4,256,654

CONVERSION OF HYDROGEN AND CARBON MONOXIDE INTO C_1–C_4 RANGE HYDROCARBONS

Warren C. Schlinger, Pasadena, and William L. Slater, La Habra, both of Calif., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 865,764, Dec. 29, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,549

Int. Cl.³ C07C *1/02, 1/04*

U.S. Cl. 260—449.6 R **9 Claims**

1. A process for producing from synthesis gas a stream of light hydrocarbon gases containing an increased yield of C_1–C_4 range saturated hydrocarbons comprising:

(1) reacting hydrocarbons or carbonaceous charge stocks ranging from methane through coal or coke by partial oxidation with a free oxygen-containing gas and H_2O at an autogenous temperature in the range of about 1600° F. to 3000° F. and a pressure in the range of about 1 to 250 atmospheres in the reaction zone of a noncatalytic synthesis gas generator to produce an effluent gas mixture;

(2) purifying the effluent gas stream from (1), thereby producing a feed gas stream substantially comprising hydro-

gen and carbon monoxide, and with or without H_2S, CO_2, H_2O and COS;

(3) passing said feed gas stream upward through an ebullient bed of particulate conversion catalyst in a reaction zone at a temperature in the range of about 600° to 1000° F., a pressure in the range of about 200 to 3000 psig, a H_2+CO space velocity in the range of about 250 to 2500 v/hr/v, a superficial gas velocity in the range of about 1 to 10 ft./sec., and a H_2/CO mole ratio in the range of at least 1:1 to about 3:1; and wherein said conversion catalyst consists essentially of iron oxide selected from the group consisting of mill scale, magnetite, and mixtures thereof, ground to a particle size in the range of about 350 to 800 microns, magnetically separated from extraneous matter, treated with an aqueous solution of potassium carbonate in an amount sufficient to deposit upon said ground iron oxide about 2–10 pounds potassium carbonate per 1000 pounds iron oxide, dried, chemically reduced with hydrogen at a temperature in the range of about 650°–800° F. and a pressure in the range of about 100 to 1000 psig until evolution of water ceases, and subsequently sulfided at an elevated temperature in the range of about 200°–900° F. with a sulfur-containing compound capable of sulfiding said catalyst such that said reduced iron catalyst contains from about 0.01 to about 0.1 weight percent sulfur;

(4) cooling the effluent gas from the reaction zone to condense out a liquid phase comprising normally liquid hydrocarbons, organic chemicals, and water; and

(5) separating a gas phase comprising light hydrocarbons containing an increased yield of C_1 to C_4 range saturated hydrocarbons, H_2, CO, H_2O and CO_2.

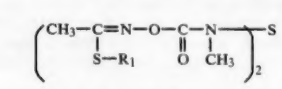
4,256,655

METHOD FOR MAKING THIOBISCARBAMATES

Robert W. Ashworth, Hackettstown, N.J., and Wallace Y. Fu, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 5, 1979, Ser. No. 70,535
Int. Cl.³ C07C *119/00*
U.S. Cl. 260—453 RW **13 Claims**

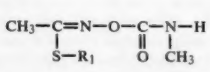
1. A method for making a compound of the formula



wherein R_1 is methyl, ethyl, n-propyl, isopropyl, n-butyl or isobutyl comprising the steps of:

(a) In presence of solvent, reacting nitrogen-containing hetrocyclic base with a sulfur chloride selected from the groups of SCl_2, S_2Cl_2, and mixtures thereof to form base-sulfur chloride adduct, and

(b) In presence of solvent, reacting said adduct with carbamate of the formula



wherein R_1 is a previously defined.

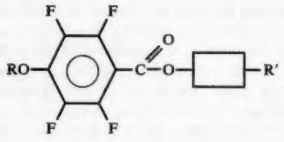
4,256,656

MESOMORPHOUS 4-ALKOXYTETRAFLUOROBENZOIC ACID ESTERS

Alain Beguin; Jean-Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

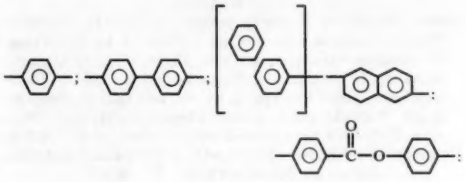
Filed Oct. 29, 1979, Ser. No. 89,157
Claims priority, application France, Oct. 27, 1978, 78 30605
Int. Cl.³ C07C *69/92, 121/75;* C09K *3/34*
U.S. Cl. 260—465 D **6 Claims**

1. A mesomorphous organic compound having the formula

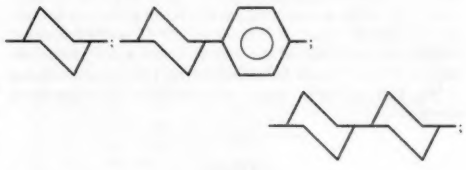


wherein R designates an alkyl radical having 1–15 carbon atoms, R′ designates hydrogen, chlorine, bromine, iodine, CF_3, CN, C_mH_{2m+1} or $C_mH_{2m+1}O$ wherein m is an integer from 1 to 15, ▭ is a radical selected from the group consisting of:

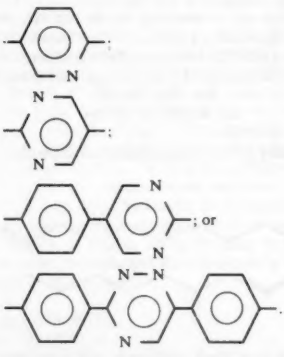
an aromatic radical of the formula



a cyclohexane radical of the formula



or a heterocyclic radical of the formula



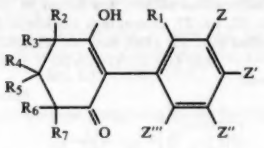
4,256,657

METHOD OF PREPARING 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUNDS

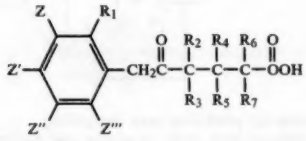
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 781,985, Mar. 28, 1977, Pat. No. 4,209,532.
This application Jan. 22, 1980, Ser. No. 114,349
Int. Cl.³ C07C *49/713, 121/80, 147/10*
U.S. Cl. 260—465 D **1 Claim**

1. A method of preparing a compound of the formula:



which comprises treating a compound of the formula:



with acid, wherein:

Z, Z', Z'' and Z''' are individually hydrogen, nitro, polyhaloalkyl, halogen, cyano, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyl, amido, amino or haloalkyl;

R_1 is alkyl, halogen, polyhaloalkyl, or haloalkyl;

R_2, R_3, R_4, R_5, R_6 and R_7 are individually hydrogen or either substituted or unsubstituted alkyl or phenyl wherein the permissible substituents are one or more alkyl, cyano, halogen, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, or dialkylamino substituents or any two R_2, R_3, R_4, R_5, R_6 or R_7 substituents together may form an alkylene or alkenylene chain having from 2 to 20 carbon atoms completing a 3, 4, 5, 6 or 7 membered ring structure;

with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7, Z, Z', Z'' and Z''' substituents individually may not include more than ten aliphatic carbon atoms.

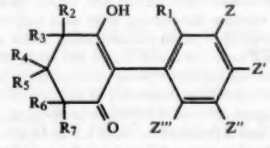
4,256,658

METHOD OF PREPARING 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUNDS

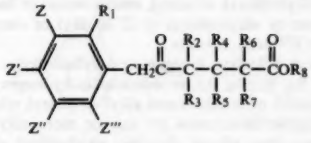
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 781,985, Mar. 28, 1977, Pat. No. 4,209,532.
This application Jan. 22, 1980, Ser. No. 114,347
Int. Cl.³ C07C *49/713, 121/80, 147/10*
U.S. Cl. 260—465 D **1 Claim**

1. A method of preparing a compound of the formula:



which comprises treating a compound of the formula:



with base, wherein:

Z, Z', Z'' and Z''' are individually hydrogen, nitro, polyhaloalkyl, halogen, cyano, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyl, amido, amino or haloalkyl.

R_1 is alkyl, halogen, polyhaloalkyl, or haloalkyl;

R_2, R_3, R_4, R_5, R_6 and R_7 are individually hydrogen or either substituted or unsubstituted alkyl or phenyl wherein the permissible substituents are one or more alkyl, cyano, halogen, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl or dialkylamino substituents or any two R_2, R_3, R_4, R_5 or R_6 substituents together may form an alkylene or alkenylene chain having from 2 to 20 carbon completing a 3, 4, 5, 6 or 7 membered ring structure;

R_8 is alkyl;

with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, Z, Z', Z'' and Z''' substituents individually may not include more than ten aliphatic carbons.

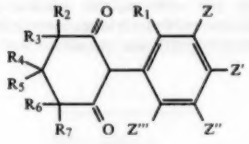
4,256,659

METHOD OF PREPARING 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUNDS

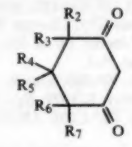
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 781,985, Mar. 28, 1977, Pat. No. 4,209,532.
This application Jan. 22, 1980, Ser. No. 114,384
Int. Cl.³ C07C *79/36, 121/76, 147/06*
U.S. Cl. 260—465 D **1 Claim**

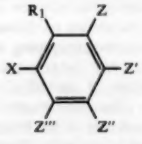
1. A method of preparing a compound of the formula:



which comprises reacting a compound of the formula:



with a compound of the formula:



in the presence of base, wherein:

X is fluorine or chlorine;

Z, Z'' and Z''' are individually hydrogen, polyhaloalkyl,

halogen, cyano, nitro, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyl, amido, amino or haloalkyl;

Z' is nitro or alkylsulfonyl or Z' is alkyl or alkoxy when either Z''' or R_1 is nitro;

R_1 is alkyl, haloalkyl, halogen, or polyhaloalkyl;

R_2, R_3, R_4, R_5, R_6, R_7 are individually hydrogen or either substituted or unsubstituted alkyl or phenyl wherein the permissible substituents are one or more alkyl, cyano, halogen, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl or dialkylamino substituents or any two R_2, R_3, R_4, R_5, R_6 or R_7 substituents together may form an alkylene or alkenylene chain having from 2 to 20 carbon atoms completing a 3, 4, 5, 6 or 7 membered ring structure;

with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7, Z, Z', Z'' and Z''' substituents individually may not include more than ten aliphatic carbon atoms.

4,256,660

SULPHONATED DERIVATIVES OF ACRYLAMIDE AND THEIR PREPARATION

Peter Flesher, Bingley, and Ian M. Johnson, Brighouse, both of England, assignors to Allied Colloids Limited, Bradford, England

Filed May 28, 1980, Ser. No. 156,944

Claims priority, application United Kingdom, May 31, 1979, 19042/79

Int. Cl.[3] **C07C** *143/02*

U.S. Cl. 260—513 N **7 Claims**

1. A process for making a compound of formula I

$$CH_2{=}CRCONHXNHCOCH_2CH_2SO_3M \quad (I)$$

wherein R is selected from hydrogen and methyl and X is selected from $—CH_2—$ and $—CH_2OCH_2—$ and M is selected from hydrogen and water soluble cations, in which N-methylolacrylamide or N-methylolmethacrylamide is reacted with sulphonated N-methylolacrylamide.

4,256,661

PRODUCTION OF THIOSEMICARBAZIDE

Danny B. Barton, Kansas City; Chester W. Halbleib, Holt, and Jack J. Lonsinger, Liberty, all of Mo., assignors to Mobay Chemical Corporation, N.J.

Continuation of Ser. No. 904,345, May 9, 1978, abandoned. This application Nov. 1, 1979, Ser. No. 90,213

Int. Cl.[3] **C07C** *159/00*

U.S. Cl. 564—18 **4 Claims**

1. In the production of thiosemicarbazide comprising the steps of reacting hydrazine and ammonium thiocyanate in aqueous solution to form hydrazinium thiocyanate and by-product ammonia, and heating the solution to effect isomerization of the hydrazinium thiocyanate to thiosemicarbazide, the improvement which comprises removing at least about 80% of the stoichiometric amount of the ammonia from the solution at a temperature from about 25° to 110° C., heating the solution up to about 105° C. to effect isomerization of about 35 to 60% of the stoichiometric amount of the hydrazinium thiocyanate, cooling whereby the thiosemicarbazide is selectively precipitated in high yield and purity, and recycling the residual solution as the solvent medium for further reaction of hydrazine and ammonium thiocyanate.

4,256,662

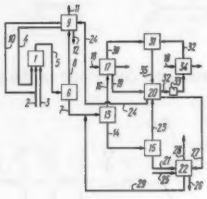
PROCESS FOR PRODUCING UREA

David M. Gorlovsky, ulitsa Gagarina, 8, kv. 4, Dzerzhinsk Gorkovskoi oblasti; Vladimir I. Kucheryavy, prospekt Ilicha, 23, kv. 13, Gorky; Kapitolina N. Sineva, bulvar Zhdanova, 9/11, kv. 86; Vladimir V. Lebedev, prospekt Lenina, 85, kv. 6, both of Dzerzhinsk Gorkovskoi oblasti; Boris I. Pikhtovnikov, ulitsa Sovetskaya, 32, kv. 142, Vidnoe Moskovskoi oblasti; Jury A. Sergeev, prospekt Pobedy, 3, kv. 18, Dzerzhinsk Gorkovskoi oblasti; Yakov S. Teplitsky, ulitsa Osipenko, 3, kv. 16; Petr E. Korshunov, 2 mikroraion, 5, kv. 10, both of Chirchik Tashkentskoi oblasti, and Sergei M. Simonov, prospekt Lenina, 85, kv. 27, Dzerzhinsk Gorkovskoi oblasti

Filed Jan. 18, 1980, Ser. No. 113,302

Int. Cl.[3] **C07C** *126/00*

U.S. Cl. 564—67 **4 Claims**



1. A process for producing urea comprising:

(a) synthesis of urea from ammonia and carbon dioxide under a pressure of from 140 to 400 ata at a temperature of from 160° to 230° C.;

(b) separation of the resulting aqueous solution of urea from the ammonia and carbon dioxide not converted to the desired product;

(c) separation of liquid or gaseous streams of ammonia and carbon dioxide from gases inert to the synthesis of urea and from the purified waste water withdrawn from the process;

(d) recycling said liquid or gaseous streams of ammonia and carbon dioxide to the synthesis of the desired product;

(e) vacuum thickening the resulting solution of urea under a pressure of from 0.04 to 0.90 ata with the recovery of dehydrated urea in the condensed phase, and a vapor phase consisting of a mixture of water, ammonia, carbon dioxide and urea;

(f) converting the dehydrated urea into solid particles and cooling in a stream of air;

(g) water washing urea dust from the air from the stage of converting the dehydrated urea into solid particles and cooling with the formation of an aqueous solution of urea delivered to said stage of vacuum thickening;

(h) condensation of the mixture of water, ammonia, carbon dioxide and urea from the vapor phase from the stage of vacuum thickening due to its indirect cooling with the formation of a liquor vapor condensate;

(i) supplying the liquor vapor condensate to the stage of separation of the gases inert to the synthesis of urea and purified waste water;

(j) supplying the ammonia and carbon dioxide contained in the uncondensed portion of the vapor phase from the stage of vacuum thickening after said indirect cooling to the stage of separation of the gases inert with respect to the synthesis of urea and purified waste water; wherein the uncondensed portion of the vapor phase from the stage of vacuum thickening after said indirect cooling is subjected to absorption-condensation under a pressure at which said vapor phase is fed to the stage of absorption-condensation, said absorption-condensation being carried out by means of direct contact of said vapor phase with a cooling agent-absorbent having a temperature of from 10° to 60° C. and a pressure of from 1.5 to 18 ata and containing dissolved in water 0.2 to 3.4% by weight of ammonia, 0 to 1.0% by weight of carbon dioxide and 0 to 50% by

weight of urea, whereafter at least a portion of the resulting solution is passed to the stage of separation of the gases inert to the synthesis of urea and purified waste water, or to the stage of separation of the aqueous solution of urea from the ammonia and carbon dioxide not converted to the desired product, or to the stage of vacuum thickening of the solution of urea.

4,256,663

19-HYDROXY-19-METHYL-6a-CARBA-PGI$_2$ AMIDES

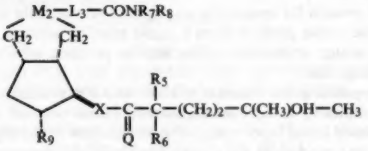
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,463

Int. Cl.^{3} C07C *103/18*

U.S. Cl. 564—188 **1 Claim**

1. A prostacyclin-type compound of the formula



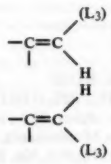
wherein L_3 is

(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,

(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or

(3) $-CH_2-CH=CH-$;

wherein M_2 is



(1)

(2)

wherein Q is oxo, α—H:β-H, α-OH:β—R_4, or α—R_4:β—OH, wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different;

wherein R_9 is hydrogen or hydroxyl; and

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$.

4,256,664

SUBSTANTIVE SUNSCREEN AGENTS

Morton B. Epstein, Chicago, Ill., and John F. Gerecht, Somerville, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

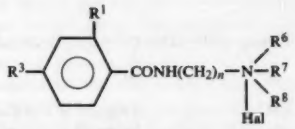
Continuation of Ser. No. 339,974, Mar. 12, 1973, abandoned, which is a division of Ser. No. 130,533, Apr. 1, 1971, abandoned. This application Mar. 1, 1976, Ser. No. 662,789

The portion of the term of this patent subsequent to Apr. 14, 1987, has been disclaimed.

Int. Cl.^{3} C07C *103/19, 103/26;* A61K *7/44*

U.S. Cl. 564—177 **4 Claims**

1. A substantive sunscreening compound of the formula



wherein:

R^1 is H or OH;

R^3 is NH_2 or NO_2 when R^1 is H and H when R^1 is OH;

R^6 and R^7 are each C_{1-5} alkyl groups;

R^8 is C_{8-18} alkyl;

n is an integer from 2 to 12; and

Hal is Cl or Br

4,256,665

PREPARATION OF β-AMINOPROPIONAMIDES

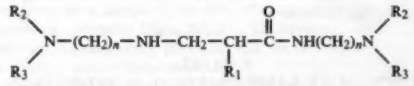
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Aug. 31, 1979, Ser. No. 71,530

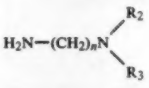
Int. Cl.^{3} C07C *102/06*

U.S. Cl. 564—135 **7 Claims**

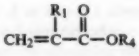
1. A process for the preparation of a β-aminopropionamide of the formula



wherein R_1 is H or methyl, n is an integer of 2 to 6 and R_2 and R_3, taken singly are hydrogen or lower alkyl groups or R_2 and R_3, taken jointly when combined with the nitrogen atom form a heterocyclic group selected from the group consisting of morpholine, pyrrollidine and piperidine ring groups, which process comprises reacting in the presence of carbon dioxide acting as a catalyst a tertiaryaminoalkyl amine of the formula.



where R_2, R_3 and n are as above with an acrylic or methacrylic compound of the formula:



where R_1 is as above and R_4 is lower alkyl and recovering said β-aminopropionamide.

4,256,666

PREPARATION OF β-AMINOPROPIONAMIDES

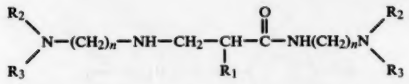
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,061

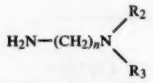
Int. Cl.^{3} C07C *102/06*

U.S. Cl. 564—135 **9 Claims**

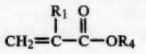
1. A process for the preparation of a β-aminopropionamide of the formula



wherein R_1 is H or methyl, n is an integer of 2 to 6 and R_2 and R_3, taken singly are hydrogen or lower alkyl groups or R_2 and R_3, taken jointly when combined with the nitrogen atom form a heterocyclic group selected from the group consisting of morpholine, pyrrolidine and piperidine ring groups, which process comprises reacting in the presence of a salt of an element of the Lanthanide Series having an anion derived from a strong acid having a pK_a of about 5 or less acting as a catalyst, a tertiaryaminoalkyl amine of the formula:



where R_2, R_3 and n are as above with an acrylic or methacrylic compound of the formula:



where R_1 is as above and R_4 is lower alkyl and recovering said β-aminopropionamide.

4,256,667

2-DECARBOXY-2-AMINOMETHYL-19-HYDROXY-19-METHYL-6a-CARBA-PGI$_2$ COMPOUNDS

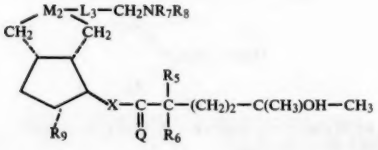
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,464

Int. Cl.[3] **C07C** *87/34, 87/40, 87/451, 87/453*

U.S. Cl. 564—384 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein L_3 is

(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,

(2) $-(CH_2)_p-CF_2-$, wherein p is 2,3, or 4, or

(3) $-CH_2-CH=CH-$;

wherein M_2 is

wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different;

wherein R_9 is hydrogen or hydroxyl; and wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$.

4,256,668

REMOVING AQUEOUS AMMONIUM SULFATE FROM OXIME PRODUCT

Chempolil T. Mathew, Randolph, and Donald Pickens, Mendham, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 20, 1979, Ser. No. 50,356

Int. Cl.[3] **C07C** *131/00, 131/04*

U.S. Cl. 564—255 **7 Claims**

1. A process for recovering an organic, substantially water-insoluble oxime product from a liquid reaction mixture comprising water, ammonium sulfate and the product, which process comprises:

(1) separating the reaction mixture into a first liquid layer comprising an aqueous ammonium sulfate solution and a second liquid layer comprising an emulsion of the organic oxime product as the continuous phase and aqueous ammonium sulfate as the discontinuous phase;

(2) passing the second liquid layer through solid ammonium sulfate for a time sufficient to agglomerate the discontinuous phase; and

(3) separating the agglomerated discontinuous phase from the continuous phase.

4,256,669

PARA-AMINOPHENOL DERIVATIVES

Roland G. Benner, New Providence, N.J., and Paul D. Henson, Roanoke, Va., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 8, 1978, Ser. No. 959,024

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.[3] **C07C** *87/58, 91/44*

U.S. Cl. 564—434 **19 Claims**

1. A method for extracting para-aminophenol with aromatic amines from a crude aqueous solution of para-aminophenol made by the reduction of nitrobenzene, which comprises contacting the crude aqueous solution with at least a sufficient amount of an aromatic amine to extract the crude para-aminophenol therefrom, and then contacting the resulting extract with a condensation catalyst to form the corresponding diaryl para-phenylenediamines.

4,256,670

PRODUCTION OF AMINO SUBSTITUTED AROMATIC COMPOUNDS

Edwin H. Homeier, Maywood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 15, 1979, Ser. No. 94,537

Int. Cl.[3] **C07C** *85/11*

U.S. Cl. 564—416 **8 Claims**

1. A process for the production of an amino substituted aromatic compound which comprises treating a nitro substituted aromatic compound at reaction conditions in the presence of a catalytic composition of matter consisting essentially of a metal phthalocyanine, and recovering the resultant amino substituted aromatic compound.

4,256,671

PRODUCTION OF 2,4- AND 2,6-DIAMINOTOLUENES

John D. Hildreth, Macclesfield; David G. Haslam, Bolton, and David E. Allen, Wilmslow, all of England, assignors to Clayton Aniline Company, Ltd., Clayton, England

Continuation-in-part of Ser. No. 923,721, Jul. 11, 1978, abandoned. This application May 11, 1979, Ser. No. 38,296
Claims priority, application United Kingdom, Nov. 24, 1977, 48948/77
Int. Cl.[3] C07C *85/11, 85/26*
U.S. Cl. 564—422 7 Claims

1. A process for the manufacture of 2,4-diaminotoluene and 2,6-diaminotoluene from a mixture of 2,4- and 2,6-dinitrotoluene which comprises catalytically hydrogenating a molten mixture of 2,4- and 2,6-dinitrotoluene in the presence of water, adding sufficient hydrochloric acid to form the diaminotoluene monohydrochlorides, crystalising 2,6-diaminotoluene monohydrochloride and filtering it from the 2,4-diaminotoluene monohydrochloride and optionally, liberating the free amine by addition of an alkali.

4,256,672

PROCESS FOR THE PREPARATION OF PHOSPHORIC ESTERS AND THIOPHOSPHORIC ESTERS

Ryuichi Yamamoto, and Masaaki Torisu, both of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 88,021
Int. Cl.[3] C07F *9/09, 9/165*
U.S. Cl. 260—974 10 Claims

1. In a process for the preparation of an ester compound selected from the group consisting of triaryl phosphates and triaryl thiophosphates by reaction of a phenol compound with phosphorus oxychloride or phosphorus thiochloride, the improvement which comprises reacting a phenol having on the benzene ring one or more substituents selected from the group consisting of amino, monoalkylamino, dialkylamino, monoacylamino and diacylamino groups with phosphorus oxychloride or phosphorus thiochloride in the presence of

(a) at least one alkali metal compound selected from the group consisting of the hydroxides and carbonates of alkali metals,

(b) water, and

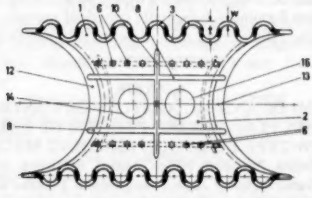
(c) an inert organic solvent, at a temperature of 80° C. or below.

4,256,673

PACKING ELEMENT FOR USE IN PACKED COLUMNS

Roland Braun, Ludwigshafen-Rheingönheim, Fed. Rep. of Germany, assignor to Raschig GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,234
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824455
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—94 12 Claims



1. A packing element for use in a packed column,

said packing element being U-shaped in cross-section and comprising

a double-curved bight portion which is arcuate in longitudinal section and in cross-section, and

two transversely spaced apart, corrugated side wall portions extending along and merging into said bight portion on one side thereof and formed with corrugations having crests and troughs which terminate at said side wall portions, said corrugations extend in a transverse direction to said side wall portions, and said corrugations extend in their longitudinal direction to and merge into said bight portion and have a crest-to-trough height in excess of the wall thickness of any part of said packing element,

said side wall portions having side edges opposite to said bight portion and said crests and troughs of said corrugations terminating in the form of projecting scallops at said side edges,

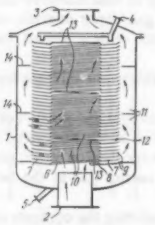
said bight portion being concave in cross-section on the side on which said side wall portions are disposed and being concave in longitudinal section on the opposite side, and said side edges being notched between said scallops.

4,256,674

COUNTER-CURRENT GAS-LIQUID CONTACT APPARATUS

Alexandr V. Shafranovsky, ulitsa Molodezhnaya, 4, kv. 7, Balashikha Moskovskoi oblasti; Vitaly R. Ruchinsky, ulitsa Vavilova, 48/4, korpus 3, kv. 245, Moscow; Violetta V. Kurkovskaya, prospekt Mira, 99, kv. 12, Moscow; Viktor M. Olevsky, Leningradsky prospekt, 75a, kv. 91, Moscow; Jury A. Baskov, shosse Entuziastov, 156, kv. 20, Moscow; Vladimir K. Chubukov, Komsomolsky prospekt, 41, kv. 97, Moscow; Vladimir P. Gavrilin, Kastanaevskaya ulitsa, 27, korpus 5, kv. 25, Moscow, and Nina M. Volkova, ulitsa Novatorov, 40, korpus 9, kv. 55, Moscow, all of U.S.S.R.

Filed Oct. 1, 1979, Ser. No. 80,494
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—112 15 Claims



1. A counter-current gas-liquid contact apparatus comprising a shell; branch pipes for admitting gas into the lower portion of said shell and discharging it from the upper portion of said shell; branch pipes for admitting liquid into the upper portion of said shell and discharging it from the lower portion of said shell; reflux plates installed in said shell one above another with gaps in between; said reflux plates are made in the form of trays open at the top, assembled into at least one separate pack, provided with counteropposed inclined rims and arranged on a a descending spiral so that there remain passages in said shell between the rims of said trays and the shell walls for the vertical flow of gas; guide baffles which are located in said passages substantially horizontally, which partition completely said passages and deflect the gas flow from one of said passages into another through the gaps between said trays in the direction from one of said rims of said trays to the other; means for delivering the liquid onto said reflux plates.

4,256,675

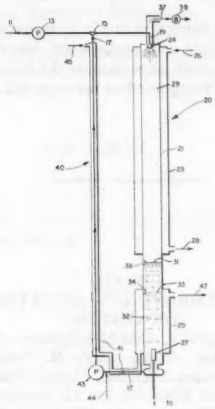
METHOD FOR GENERATING SUPER ATMOSPHERIC PRESSURES OF SENSITIVE MATERIALS IN A GAS STREAM

Thomas H. Vanderspurt, Gillette, N.J., and Paul D. Taylor, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 819,750, Jul. 28, 1977, Pat. No. 4,190,620. This application Oct. 30, 1978, Ser. No. 955,594

Int. Cl.³ B01J *8/00*

U.S. Cl. 261—128 **23 Claims**



1. A process for converting a heat sensitive organic material from a liquid state to a vapor state at an elevated pressure in combination with a carrier gas which comprises:

A. In a primary vaporization stage of a tower maintained at a selected pressure, passing liquid sensitive organic material downwardly and countercurrently to an ascending carrier gas which heats said sensitive material to vaporize at least a portion of said sensitive material to said vapor state and form a gas/vapor mixture, said carrier gas being heated by contact with a heated inner surface of said tower;

B. removing said gas/vapor mixture from said primary vaporization stage;

C. collecting the unvaporized portion of said sensitive material as a liquid pool at the bottom of said tower;

D. as a secondary vaporization stage, generating a stream of bubbles of said carrier gas at the bottom of said liquid pool; and

E. cooling and circulating the contents of said liquid pool to, and mixing with, said liquid sensitive material to form a liquid mixture before passage thereof to said primary vaporization stage.

7. A process in accordance with claim **1** wherein the height of the liquid level of the liquid pool is measured and controlled, and make-up solvent is added as required.

4,256,676

PROCESS FOR PREPARING POROUS METAL OXIDE BEADS

Julius L. Kovach, 2948 Brookdown Dr., Worthington, Ohio 43085

Filed Nov. 22, 1978, Ser. No. 962,976

Int. Cl.³ B21C *21/00*

U.S. Cl. 264—0.5 **19 Claims**

1. A process for making porous bead-like material of controlled particle size comprising the steps of:

(a) mixing a powdered metal oxide and a thermally decomposable organic binder comprising a monomer of a thermosetting polymer;

(b) forming the resulting mixture into particles of a uniform particle size; and

(c) heating the particles to a temperature sufficient to convert the organic binder to carbonaceous material.

2. The process of claim **1** wherein said mixing step further comprises the inclusion of a powdered organic porosity control agent selected from the group consisting of sugar, starch, cellulose, and wood flour.

11. The process of claim **1** or **2** wherein said metal oxide is selected from the group consisting of Fe_2O_3, thoria, manganese oxide, vanadium oxide, and mixtures thereof.

4,256,677

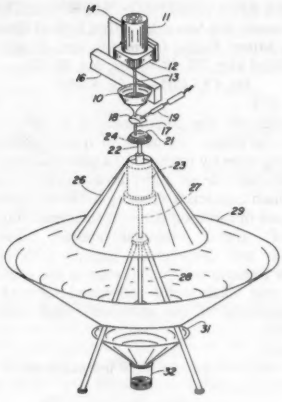
APPARATUS AND METHOD FOR MAKING SMALL SPHERES

Lawrence L. Lee, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Co., Fort Wayne, Ind.

Filed Apr. 12, 1976, Ser. No. 675,860

Int. Cl.³ B01J *2/14*

U.S. Cl. 264—8 **15 Claims**



1. Apparatus for making substantially spherical particles of uniform size from a material, comprising: a rotatable wheel having at least one convex side adapted to receive the material, said wheel having a plurality of tapered teeth formed about the periphery thereof and extending radially therefrom; means to rotate said wheel at a predetermined constant speed; heating means to heat said wheel so that the material melts when coming in contact with said convex side of said wheel and forms beads on said teeth as said wheel is rotated; and a receptacle placed a predetermined distance from said wheel to receive solidified droplets formed from beads leaving said wheel, the droplets forming substantially spherical particles and solidifying while falling from said wheel to said receptacle.

4,256,678

METHOD OF AND APPARATUS FOR CONTROLLING RESIN PLASTICIZING PROCESS OF IN-LINE SCREW-TYPE INJECTION MOLDING MACHINES

Shigeru Fujita, Numazu; Hideo Banzai, Mishima, and Takashi Goto, Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1979, Ser. No. 81,203

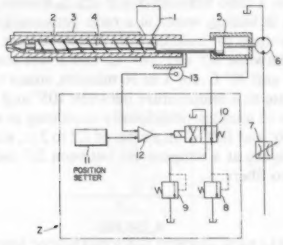
Claims priority, application Japan, Oct. 5, 1978, 53-122832

Int. Cl.³ B29F *1/06*

U.S. Cl. 264—40.1 **5 Claims**

1. In a method of controlling a plasticizing process of a resin of an in-line screw-type injection molding machine of the type

comprising a heating cylinder, means for supplying the resin into said heating cylinder at one end thereof, a screw provided in said heating cylinder, and hydraulic means for reciprocating and rotating said screw in said heating cylinder, in which back pressure of said screw is controlled during the resin plasticizing process, the improvement which comprises the steps of detecting a process variable regarding a position of the screw, presetting a position of said screw at which a first back pressure of the screw and a second back pressure for compensating for said first back pressure are to be alternately switched, comparing a signal regarding the screw position with a signal regarding the back pressure switching position, and switching said first and second back pressures alternately in accordance with a predetermined sequence, thereby making uniform temperature distribution of the resin for one injection molding shot existing in a space between threads of said screw after the completion of the resin plasticizing process.



3. In apparatus for controlling a plasticizing process of a resin of an in-line screw-type injection molding machine of the type comprising a heating cylinder, means for supplying the resin into said heating cylinder at one end thereof, a screw provided in said heating cylinder, and hydraulic means for reciprocating and rotating said screw, said hydraulic means being controlled during the resin plasticizing process, the improvement which comprises means for detecting a process variable regarding a position of said screw, means for presetting a position of said screw at which a first back pressure of the screw and a second back pressure for compensating for said first back pressure are to be alternately switched, a comparator for comparing a signal from said detecting means with a signal from said switching position presetting means, and means for alternately switching said first and second back pressures.

4,256,679

PROCESS AND DEVICE FOR FILLING CAVITIES, PARTICULARLY MOLD CAVITIES, WITH A REACTIVE, FLOWABLE MIXTURE

Ulrich Osinski, Koenigswinter, and Rene Kummer, Bornheim-Kardorf, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

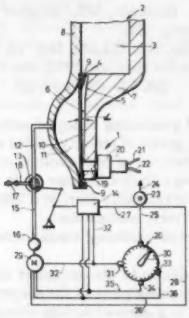
Filed Jun. 28, 1979, Ser. No. 52,876

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829016

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—51 **15 Claims**

1. In a process for filling a mold with a reactive, flowable mixture which preferably forms foam, wherein at least two reaction components are brought into a mixing means, where said components are mixed and subsequently brought into a cavity of a mold, the improvement wherein, at the beginning of the filling process, a first portion of the reaction mixture is fed into the cavity of said mold under low flow velocity until the mixture has reached a preselected level in the cavity of said mold, less than full, and subsequently the remaining portion of



the mixture to be injected is fed in under increased flow velocity.

4,256,680

METHOD AND APPARATUS FOR PRODUCING REINFORCED SYNTHETIC RESIN PIPE

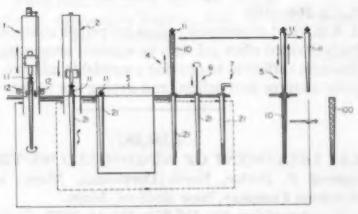
Fumio Usui, 441, Shimofusa, Tama-ku, Kawasaki-shi, Kanagawa-ken, Japan

Filed Dec. 11, 1978, Ser. No. 967,894

Claims priority, application Japan, Aug. 25, 1978, 53-103504; Aug. 25, 1978, 53-103505; Aug. 25, 1978, 53-103506

Int. Cl.³ B29C *27/28;* **B28B** *1/08*

U.S. Cl. 264—71 **15 Claims**



1. A method for producing a reinforced synthetic resin pipe, comprising the steps of:

suspending a core bar vertically;

winding a reinforcing material therearound for forming a reinforcing preform;

pouring a predetermined quantity of a hardenable liquid synthetic resin into the mold cavity of a mold for the pipe;

inserting said core bar into said mold and urging said core bar into said mold while applying vibration to said resin;

hardening said hardenable synthetic resin into a molding while said core bar remains in said mold;

stripping said core bar from said mold; and

where the molding remains on the core bar during stripping, separating said hardened molding from said core bar, and where said molding remains in the mold during the stripping, separating the molding from the mold.

4,256,681

METHOD OF PRODUCING SEMICRYSTALLINE SILICON

Joseph Lindmayer, Bethesda, Md., assignor to Semix Incorporated, Gaithersburg, Md.

Continuation of Ser. No. 751,342, Dec. 16, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 959,982
Int. Cl.[3] C04B 35/60
U.S. Cl. 264—85 10 Claims

1. A method of producing a doped semicrystalline silicon body formed from grains of semicrystalline silicon and suitable for use as a host material of photovoltaic cells, comprising:

(a) placing silicon of indiscriminate grain size in a container that remains substantially inert at a temperature at which silicon is in a freely molten state,

(b) providing a non-oxidizing atmosphere in the vicinity of the container,

(c) heating the silicon in the container to a temperature in excess of the melting point of the silicon so that formed in said container is a mass of molten silicon having incorporated therein a dopant of a single conductivity type,

(d) gradually cooling the silicon mass to a temperature at its solidification point, such cooling taking place over a period of time such that the silicon forms crystal centers at generally random locations throughout the molten silicon mass,

(e) maintaining the silicon mass at said solidification temperature to enlarge the crystallites formed at said crystal centers until they have an average mean diameter of at least about one mm. and are generally randomly distributed in substantially non-columnar, non-linear fashion throughout the silicon mass, and

(f) thereafter completing the cooling of the silicon mass to ambient temperature to form a semicrystalline silicon body doped with an impurity of a single conductivity, said body having randomly arranged silicon grains of a mean diameter of at least about one mm. at a surface thereof and adapted for use as a host material in photovoltaic cells.

4,256,682

METHOD OF PREPARING SILICA GEL PELLETS

Dean A. Denton, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 5, 1980, Ser. No. 127,274
Int. Cl.[3] B01J 2/22
U.S. Cl. 264—109 45 Claims

1. A method of preparing silica gel pellets comprising mixing a finely divided silica gel with an aqueous ammoniacal medium in amounts sufficient to provide a moldable mixture, compressing the mixture into pellets, and drying the pellets.

4,256,683

HEAT TREATMENT OF WINDSHIELD WIPER BLADES

Raymond P. Porter, North Dartmouth, Mass., assignor to Acushnet Company, New Bedford, Mass.

Continuation of Ser. No. 815,521, Jul. 14, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,480
Int. Cl.[3] B29C 25/00
U.S. Cl. 264—157 17 Claims

1. A process of making an improved flexible windshield wiper blade from a double windshield wiper blade of two windshield wiper blades joined at their lips comprising severing the wiper blades to separate them and form the lip edge and thereafter dry heat treating at least the lip of one separated wiper blade, the heat treatment being at a temperature of from about 60° C. to about 160° C. for a period of time from about 18 hours to about 30 seconds.

16. A process of making an improved flexible windshield wiper blade from a double windshield wiper blade of two windshield wiper blades joined at their lips comprising severing the wiper blades to separate them and form the lip edge and thereafter heat treating the separated windshield wiper blade in a liquid bath at a temperature of from about 110° C. to about 160° C. for a period of time effective to improve the wipe of the blade.

4,256,684

HIGH-SHRINKAGE ACRYLIC FIBERS AND THE PROCESS FOR THEIR PRODUCTION

Georges Achard, Decines; Gilbert Anouilh, Lyons; Pierre Chion, Bron, and Roger Vincent, Colmar, all of France, assignors to Rhone-Poulenc Textile, Paris, France

Filed Jun. 1, 1979, Ser. No. 44,690
Claims priority, application France, Jun. 5, 1978, 78 16979; Apr. 10, 1979, 79 09256
Int. Cl.[3] D01D 5/22
U.S. Cl. 264—168 5 Claims

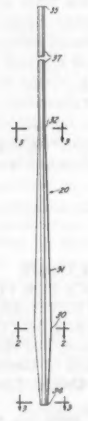
1. A process for the production of acrylic yarns and fibers having a latent shrinkage of up to 50% in boiling water, characterized in wet spinning at least one solution of acrylic polymer, stretching the resulting filaments in air, at ambient temperature, in a ratio between 2 and 2.5×, washing with water, stretching in boiling water in a ratio between 1.05 and 1.8×, sizing, drying in the relaxed state in a zone kept at a dry temperature between 80° and 140° C. and a wet temperature between 50° and 70° C. for 1 to 30 minutes, steam treating in the relaxed state at a temperature between 105° and 150° C. for 5 seconds to 30 minutes, additionally stretching at a temperature between 90° and 100° C. in a ratio of 1.2 to 2×, sizing, mechanically crimping at a temperature between 20° and 75° C., and cutting into fibers.

4,256,685

VARIABLE PROFILE EXTRUSION METHOD

Clyde W. Vassar, Winooski, Vt., assignor to W. James Kemerer, Long Beach, Calif., a part interest

Division of Ser. No. 815,699, Jul. 5, 1977, Pat. No. 4,187,068. This application Nov. 24, 1978, Ser. No. 963,290
Int. Cl.[3] B29F 3/04
U.S. Cl. 264—167 4 Claims



1. A method for extruding an elongated article having a profile which remains the same in at least one radial direction along its length and which may be varied in at least three other radial directions along its length comprising the steps of:

forming an orifice in a fixed die member which is stationary in at least one radial direction and which may be varied in at least three other radial directions using a plurality of movable extrusion die members,

forcing a thermoplastic extrudate stock material in flowable form through said orifice, and

varying the position of at least two of said movable die

members while forcing said stock material through said orifice thereby maintaining the profile the same in at least one radial direction while simultaneously varying the profile of the orifice in at least two other radial directions for forming an elongated extrudate article having a constant profile in at least one radial direction and a varying profile in at least two radial directions conforming to the varying profile of said orifice.

4,256,686

METHOD AND DEVICE FOR THE PRODUCTION OF AN OXIDE CERAMIC TUBE

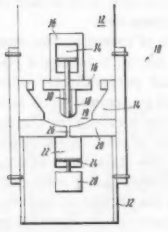
Leonhard E. Froschauer; Rudolf U. B. Knape, and Dieter H. Schmidt, all of Aschau, Fed. Rep. of Germany, assignors to W. Haldenwanger KG, Waldkraiburg, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 889,105

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715852

Int. Cl.[3] B29D *23/04*

U.S. Cl. 264—209 1 Claim



1. A method for the production of an oxide ceramic tube which is completely closed at one end by a continuous process comprising the steps of:

extruding plasticized oxide ceramic material through a screen and over a spike;

closing a die having a hemisphere shape for forming the end;

increasing a space associated with the die as the extrusion process continues which space is connected with the die cavity by means of a first venting hole;

after complete formation of the closed end, moving the die downward and sideways to clear the tube;

opening a second venting hole in the spike by retraction of a needle for the admission of air into the inside of the tube; and

continuing extrusion of the tube to a desired length with the admission of air to the inside of the tube to prevent collapse of the tube.

4,256,687

PROCESS FOR PRODUCING MOLDED ARTICLES

Katsuya Yazaki, Kawasaki; Takashi Inoue, and Shohji Mori, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1978, Ser. No. 958,600

Claims priority, application Japan, Nov. 11, 1977, 52-134640

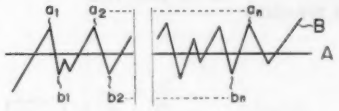
Int. Cl.[3] D01D *5/12*

U.S. Cl. 264—210.1 4 Claims

1. A process for producing molded containers comprising the steps of:

(a) passing, under non-lubrication rolling conditions, a crystalline polyolefin resin melt in sheet form at 220° to 250° C. through between rolls each having a surface roughness of not higher than 1S, as determined according to JIS B0601-55, and a surface temperature of not higher than 50° C. while simultaneously contacting both faces of the resin melt in sheet form with the rolls respectively, followed by still contacting at least one of the faces of the sheet with the roll or other rolls having the same surface roughness, to solidify the resin melt in sheet form thereby obtaining a sheet having a surface roughness of not higher than 0.7μ RMS on each face,

(b) further passing, under non-lubrication rolling conditions, the thus obtained sheet through between at least one pair of rolls having a surface roughness of not more than 0.8S and rotating in the direction opposite to each other and having therebetween a clearance smaller than the thickness of the sheet while maintaining the sheet at lower than the crystalline melting point thereof, to roll the sheet in a rolling ratio of 1.1–2.0 thereby obtaining a rolled, oriented sheet and then



(c) forming the thus obtained rolled sheet under pressure while maintaining the rolled sheet at lower than the crystalline melting point thereof by not more than 40° C., thereby to obtain the molded articles.

4,256,688

METHOD FOR MANUFACTURING AN OBJECT OF SILICON NITRIDE

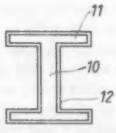
Jan Adlerborn; Hans Larker, and Jan Nilsson, all of Robertsfors, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Aug. 28, 1979, Ser. No. 70,636

Claims priority, application Sweden, Aug. 29, 1978, 7809075

Int. Cl.[3] C04B *33/32*

U.S. Cl. 264—325 1 Claim



1. In a method for manufacturing an object of sintered silicon nitride which comprises preforming a body from silicon nitride powder, enclosing the body in a glass casing, and subjecting the enclosed body to isostatic pressing with a gaseous pressure medium in a pressure vessel maintained at a temperature sufficient to sinter the silicon nitride, the improvement comprising freeing the glass casing from the sintered object after the pressing and sintering operations have been completed by adjusting the condition of pressure and temperature in the pressure vessel such that the temperature is at a level sufficient to maintain the glass of the casing in a plastic state and the pressure surrounding the glass casing is at a level below the partial pressure of nitrogen gas above silicon nitride due to dissociation of the latter at said temperature level.

4,256,689

INJECTION MOULDING METHOD AND APPARATUS WITH MOULD RUNNER RESERVOIR AND SHOT EXTENSION

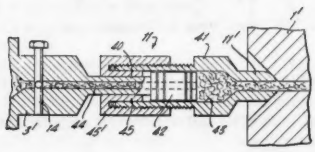
Victor T. Gardner, Staniforth Rd., Sheffield S9 4LS, England

Continuation of Ser. No. 725,327, Sep. 21, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,448

Claims priority, application United Kingdom, Oct. 31, 1975, 47237/75

Int. Cl.[3] B29F *1/06*

U.S. Cl. 264—328.8 2 Claims



1. A method of injection moulding an article comprising the steps of:

providing an injection mould having a runner system extending from an article forming cavity therein to a mould port, an injection device including a plasticizing chamber and a nozzle communicating therewith, a screw rotatable in the plasticizing chamber to plasticize plastics material and operable as a reciprocatable ram to eject fluidized material through said nozzle on an injection stroke, and a generally cylindrical chamber communicating at one end with said mould port and open at the other end for receiving the end of the nozzle for piston-like movement therein,

rotating said screw to plasticize plastics material in said plasticizing chamber,

retracting said nozzle in a direction out of said cylindrical chamber and feeding a charge of plasticized material from the plasticizing chamber into the cylindrical chamber,

with respective charges of plasticized plastics material in the plasticizing and cylindrical chambers in front of the screw and nozzle, respectively, advancing said screw in said plasticizing chamber to inject the plasticized material therein through said nozzle and said mould port into said mould during the injection stroke of said screw, and advancing the nozzle forwardly in the cylindrical chamber to inject the plasticized material therein into the mould,

while continuing to advance said screw in said plasticizing chamber on its injection stroke to inject plasticizing material through said nozzle into said cylindrical chamber, at the same time permitting said nozzle to retract in a direction out of said cylindrical chamber under the pressure of the plasticized material being injected into said cylindrical chamber,

blocking the flow of plasticized material between the plasticizing chamber and at the end of the nozzle,

advancing the end of the nozzle forwardly in said generally cylindrical chamber to inject plasticized material in said cylindrical chamber into said mould to fill said forming cavity and thereafter continuing to urge the end of the nozzle forwardly to exert a positive pressure on the material in the mould as such material cools and an article is being formed, and

simultaneously with advancing the nozzle in the cylindrical chamber, rotating and withdrawing said screw to build up a charge of plasticized material in front of it in the plasticizing chamber.

4,256,690

VACUUM FORMING METHOD

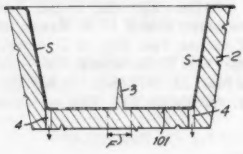
Pierluigi Sabba, Massa Lombarda, Italy, assignor to NESPAK S.p.A. Societa Generale per l'Imballaggio, Massa Lombarda, Italy

Filed Apr. 3, 1979, Ser. No. 26,501

Claims priority, application Italy, Apr. 10, 1978, 12557 A/78

Int. Cl.[3] B29C *17/04, 17/14*

U.S. Cl. 264—504 1 Claim



1. A method for vacuum thermoforming and simultaneous piercing at least one hole in an article formed of thermoplastic material which comprises:

placing a sheet of thermoplastic material over at least one cup-shaped die, each having a pointed projection at the center of and perpendicular with its bottom with the length of said projection much less than the depth of said cup-shaped die; securing the thermoplastic material along the periphery of each cup-shaped die enclosing an area within each cup-shaped die; evacuating the enclosed area of said cup-shaped die between said sheet of thermoplastic material and the bottom of said cup-shaped die; heat-softening said thermoplastic material until said sheet is drawn into said evacuated area of said cup-shaped die and touches the tip of said pointed projection; further evacuating said area and heating said thermoplastic sheet until said sheet touches the bottom of said die encompassing said pointed projection along an annular zone on the bottom of said die; then forming a hole in said sheet by continually evacuating said area until said pointed projection pierces said sheet and said pierced portion of said sheet slides down to the bottom of said die; continually evacuating said area until the portion of said sheet outwardly of said annular zone is drawn downwardly against the bottom and sides of said die thereby conforming to the shape of the die; said hole being widened to a diameter greater than the maximum diameter of said pointed projection; and permitting said heat softened sheet to cool.

4,256,691

AQUEOUS SULFUR DISPERSION HAVING REDUCED CORROSIVE ACTIVITY TOWARD FERROUS METAL

Louis E. Ott, Oswego, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 14, 1978, Ser. No. 969,487

Int. Cl.[3] C23F *11/00*

U.S. Cl. 422—7 10 Claims

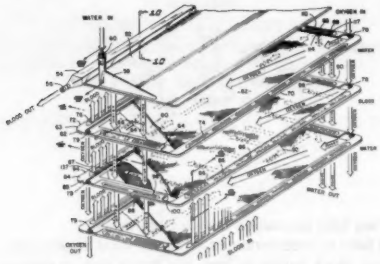
1. A method of reducing the corrosion of ferrous metal in physical contact with an aqueous dispersion of elemental sulfur which comprises adding to said dispersion an effective amount of an inhibitor solution for reducing said corrosion, wherein the inhibitor solution comprises a solution in aqueous ammonia of at least one metal compound selected from the group consisting of soluble zinc and magnesium compounds, and the moles of ammonia per gram-atom of metal from the metal compound is from about 0.1 to about 200.

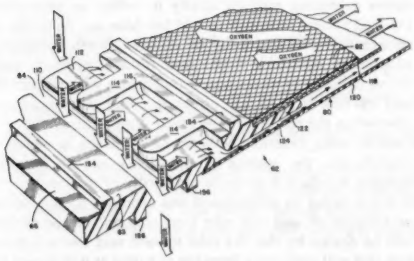
4,256,692

MEMBRANE OXYGENATOR

Walter E. Cover, Mission Viejo, Calif., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 1, 1979, Ser. No. 8,600
Int. Cl.[3] A61M 1/03
U.S. Cl. 422—46 16 Claims





1. A membrane device having particular utility as a blood oxygenator, comprising:

a plurality of blood modules and water modules arranged in an alternating configuration, said blood modules defining a flow path for blood through and across each blood module, and said water modules defining a flow path for water through and across each water module,

each said blood module and water module comprising an integral frame having (i) an envelope suspended within and surrounded by said frame; (ii) an oxygen inlet port and an oxygen outlet port configured such that oxygen is caused to flow between adjacent modules; (iii) tongues and grooves located on each said frame such that the tongues of one frame are disposed in associated grooves of an adjacent frame and circumferentially surround the blood flow path through each blood module and the water flow path through each water module; and (iv) a recessed area means formed in each said frame adjacent said oxygen outlet port for directing any water leakage from a water module out of the device through the oxygen outlet ports, or to the exterior of the modules or to both and away from the blood flow path; and

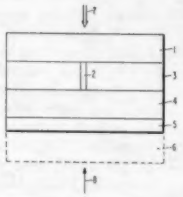
elongated sealing means disposed between the tongues and associated grooves of adjacent frames such that if water leaks from a water module said sealing means will cause such water leakage to be directed to said recessed area means or to the exterior of the modules or to both, whereby such leakage will be prevented from entering the blood flow path.

4,256,693

MULTILAYERED INTEGRAL CHEMICAL ANALYSIS ELEMENT FOR THE BLOOD

Asaji Kondo, and Masao Kitajima, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 6, 1979, Ser. No. 46,125
Claims priority, application Japan, Jun. 6, 1978, 53-77177[U]
Int. Cl.[3] G01N 33/48, 33/06, 33/52
U.S. Cl. 422—56 5 Claims



1. A multilayered integral chemical analysis element for a blood sample, said element comprising a filter layer capable of removing formed components comprising leucocytes, erythrocytes and platelets in the blood, a water-proof layer having at least one small opening therein, a porous spreading layer, and a reagent layer laminated in this order.

4,256,694

CARBON MONOXIDE MONITORING SYSTEM

Jerome W. McAllister; Gunter A. Kohler, and Virtudes R. Lund, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 5, 1978, Ser. No. 912,344
Int. Cl.[3] G01N 21/29, 21/77, 31/22
U.S. Cl. 422—58 17 Claims

1. Colorimetric indicator material for the detection of carbon monoxide in ambient air comprising alumina having sorbed thereon a mixture containing silver ion and permanganate ion in a molar ratio of about 4:1 to about 1:4, said mixture, upon exposure to air containing carbon monoxide undergoing a color change from purple to brown at a rate proportional to the ratio of silver ion to permanganate ion in said mixture and the atmospheric CO concentration.

4,256,695

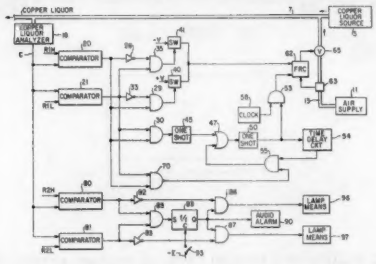
COPPER LIQUOR CONTROL SYSTEM

Ronald G. Gillespie, Old Tappan, N.J., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,456
Int. Cl.[3] G01N 27/00; G06F 15/46
U.S. Cl. 422—62 6 Claims

1. A control system for controlling the strength of a copper

liquor which contains cupric ions and cuprous ions, comprising means for sensing the strength of the copper liquor and providing a corresponding strength signal, reference signal means for providing a first set of reference signals corresponding to an upper control limit and to a lower control limit for the strength of the copper liquor, first comparing means connected to the sensing means and to the reference signal means for comparing



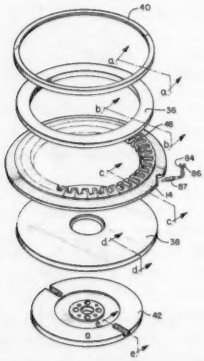
the strength signal with the first set of reference signals and providing a first comparison signal in accordance with the comparison, and means connected to the comparing means for controlling the addition of air to the copper liquor to control the cupric ion content and the cuprous ion content of the copper liquor so as to control the strength of the copper liquor in accordance with the first comparison signal.

4,256,696

CUVETTE ROTOR ASSEMBLY

Charles Soodak, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 21, 1980, Ser. No. 113,766
Int. Cl.³ G01N *21/07*
U.S. Cl. 422—72 **10 Claims**



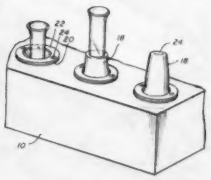
1. An improved cuvette rotor assembly for use in a multistation photometric analyzer of the type wherein several chemical reactions are sequentially monitored over a predetermined time span, wherein there is situated a ring shaped cuvette rotor having an outer circular periphery and an inner circular periphery, a first side and a second side and cuvette forming slots extending between the sides and into the rotor from the inner periphery toward the outer periphery and into which a mixture of reagent and sample is urged by centrifugal force as the rotor is rotating, and wherein a fixed beam of light is directed at one side of the rotor as the rotor is rotating and the light that passes through each cuvette as a reaction is taking place therein is sensed and measured, the improvement residing in said assembly including a ring shaped cuvette rotor made of forged and age hardened chromium copper material.

4,256,697

BLOOD INCUBATOR DEVICE

Fred Baldwin, c/o Cryosan, Inc., 850 Providence Hwy., P.O. Box 351, Dedham, Mass. 02026

Filed Dec. 21, 1978, Ser. No. 971,653
Int. Cl.³ B01L *7/02*
U.S. Cl. 422—104 **6 Claims**



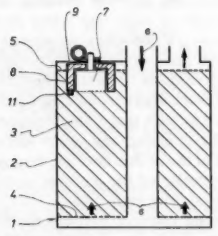
1. A test tube incubation device comprising:
a test tube of predetermined cross-sectional dimensions;
a heater block having at least one cavity formed therein;
an elongate, finger-like sleeve having an open end and a closed end, the open end of the sleeve being secured with respect to the heater block in the region of the open end of the cavity, the sleeve being formed from a resilient, flexible material displaying good heat transfer properties, the sleeve extending into the cavity to define an externally exposed pocket receptive to said test tube and defining, in cooperation with the cavity, an enclosed interior chamber adapted to contain a fluent heat transfer medium, said sleeve being of cross-sectional dimensions with respect to said test tube as to effect a circumferential grip on the test tube when the test tube is received within the sleeve;
the sleeve being eversible between said position in which it extends into the interior of the cavity and an everted position in which it projects outwardly of the cavity;
said sleeve being so constructed and arranged so that upon withdrawal of said test tube from said pocket the sleeve will be drawn by the test tube toward said everted position and will peel away from the test tube as it is drawn to its everted position; and
a concave dimple formed at the closed end of the sleeve.

4,256,698

CHEMICAL CARTRIDGE FOR RESPIRATORS

Ernst Warncke, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,090
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908913
Int. Cl.³ C01F *1/00, 5/00*
U.S. Cl. 422—122 **8 Claims**



1. A chemical cartridge, for giving off oxygen, particularly for respirators, comprising, a container having an oxygen-liberating chemical therein, a spark plug developing heat and oxygen when started arranged adjacent said chemical and

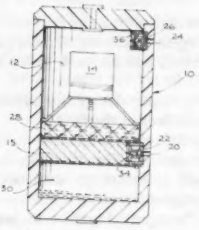
providing a starting aid therefor, and a container of a shape to extend around at least the sides of said spark plug and being filled with water and having an opening for supplying water to said chemical, and plug sealing means closing the opening and being removable after starting said spark plug to supply water to said chemical.

4,256,699

PRESSURE EQUALIZATION SYSTEM

Dennis Kraft, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 26, 1978, Ser. No. 955,138
Int. Cl.³ B01J *19/08*
U.S. Cl. 422—166 **7 Claims**



1. An apparatus useful in a deep ocean environment for housing a functional device comprising:

a substantially closed vessel for underwater use defining a first substantially moisture free chamber for enveloping and protecting said functional device;

a quantity of a selected gas producing material supported in said vessel;

means responsive to increases in the pressure of the external environment surrounding said apparatus for initiating the production of gas by said gas producing material;

means for communicating said gas with said first chamber; and

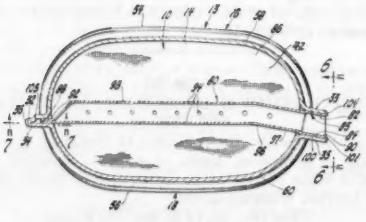
means for regulating the gas pressure within said first chamber to stabilize at a value approximately equal to the external pressure of the environment surrounding said apparatus.

4,256,700

CATALYTIC CONVERTER WITH AIR TUBE

Jack E. Smith, Grand Blanc; David E. Roberts, Flint, and John I. Jalbing, Millington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 16, 1979, Ser. No. 30,088
Int. Cl.³ B01J *8/04;* **F01N** *3/28, 3/30*
U.S. Cl. 422—177 **4 Claims**



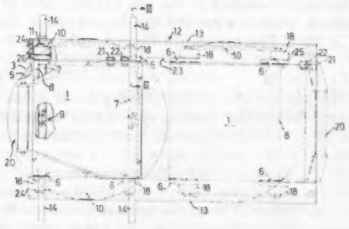
1. In a catalytic converter for internal combustion engine exhaust gases and of the type having oxidizing catalyst means mounted in a housing wherein the housing is comprised of two sheet metal shell members having mating flanges which extend along opposite sides thereof and alongside the oxidizing catalyst means and are sealingly welded together and wherein air is injected into the housing for oxidation of the exhaust gases: the improvement comprising in combination, an opening formed between the shell member flanges on one side of the housing, an air tube extending through said opening and across the interior of the housing, said air tube having a closed end within the housing, said air tube further having a plurality of holes for delivering air into the exhaust gases in the housing, an external weld between said air tube and the shell member flanges forming said opening whereby the air tube is permanently sealingly secured to the housing external thereof, and pocket means formed between the interior sides of the shell member flanges on the opposite side of the housing inward of where these shell member flanges are welded, said pocket means being sealed by the associated flange weld and open to the interior of the housing for slidably supporting said closed end of the air tube between the shell member flanges on said opposite side whereby the air tube and the housing are free to expand with heat relative to each other while the air tube remains firmly supported at the housing sides and whereby the sealed integrity of the housing is undisturbed by the closed end of the air tube.

4,256,701

PRESSURE VESSEL WITH HATCH

Arne I. Johansson, Ängsvägen 7, S-840 70 Hammarstrand, Sweden

Filed Apr. 10, 1979, Ser. No. 28,921
Int. Cl.³ B01J *3/03;* **F16J** *12/00*
U.S. Cl. 422—242 **4 Claims**



1. A pressure vessel comprising a hatch movable between a locked position in which it seals an opening in the pressure vessel, and an open position in which it at least partly exposes the pressure vessel opening and makes the interior of the pressure vessel accessible, said hatch being movable in two directions sequential to each other and mutually at least substantially perpendicular, of which one direction substantially coincides with the geometric axis of the pressure vessel opening and the other at least generally extends laterally of the opening, said hatch having for said movement in said two directions a plurality of eccentrically mounted cam members, which are joined to each other for common pivotal movements between two end positions in planes perpendicular to the plane of the hatch, are provided and are in engagement with a guide means in front of the hatch and extending to one side of the pressure vessel opening, are at one of their pivotal end positions reciprocally displaceable laterally of the opening together with the hatch while carrying the hatch in said guide means, are at the other of their pivotal end positions engageable against the hatch with support in the guide means for inserting into and locking the hatch against the pressure vessel opening and for displacing the hatch reciprocally in the direction at least substantially coinciding with the geometrical axis of the pressure vessel opening during their pivotal movements between said both pivotal end positions, and are each provided with a roller mounted eccentrically on them for rotation, which rollers in one pivotal end position of the cam members constitute running wheels in the guide means and in the vicinity of the other

pivotal end position constitute cam surfaces on said cam members but are unloaded in the locked position of the hatch by said support of said cam members in the guide means, so that the excess pressure in the vessel does not act on said rollers but is instead taken up by said cam members.

4,256,702

PROCESS FOR THE SEPARATION OF URANIUM CONTAINED IN AN ALKALINE LIQUOR

Georges Lyaudet, Chilly Mazarin, and Jean Vial, Clamart, both of France, assignors to Compagnie Generale des Matieres Nucleaires (Cogema), Paris, France

Filed Feb. 8, 1978, Ser. No. 876,157
Claims priority, application France, Feb. 9, 1977, 77 03639
Int. Cl.[2] C01G *43/00*
U.S. Cl. 423—7 **11 Claims**

1. A process for the treatment of an alkaline uraniferous solution, said solution comprising dissolved uranium and alkaline metal salts, dissolved uranium and alkaline metal complexes, or both, which comprises contacting said solution with a cationic ion exchange resin, initially in the ammonium form, to cause exchange of the alkaline metal ions of said salts, complexes, or both, and of the ammonium ions of said ion exchange resin, and after the ion exchange has been effected, collecting a solution comprising dissolved salts of uranium and ammonia, dissolved complexes of uranium and ammonia, or both.

4,256,703

FLY ASH COLLECTION

Shyam N. S. Dixit; Douglas I. Bain, both of Cincinnati, Ohio, and David A. Carter, Barrington, Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 521,610, Nov. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 437,750, Sep. 20, 1978. This application Dec. 26, 1979, Ser. No. 107,400
Int. Cl.[3] C01G *1/02*; B01D *45/00*
U.S. Cl. 423—23 **19 Claims**

9. The method of recovering heavy metal values in a coal-burning utility boiler system, said system carrying particles entrained in a stream of particle laden gas, comprising feeding an additive to the particle laden gas at a temperature of 2600° to 3300° F., above the fireball, and at a rate of 0.05 pounds–10 pounds per ton of coal burned; said additive consisting essentially of a mixture of magnesia with alumina or talc; whereby the finer particulates, carrying said heavy metal values, agglomerate into larger particulates, and said larger particulates are collected before reaching the stack.

4,256,704

HYDROMETALLURGICAL PROCESS FOR THE RECOVERY OF SILVER AS SILVER HALIDE OR SILVER PSEUDOHALIDE FROM WASTE PHOTOGRAPHIC PAPER AND FILM AND OTHER SENSITIZED MATERIALS

Michael S. Howard, c/o Literature Search Services, P.O. Box 24 084, Tel Aviv, Israel

Filed May 3, 1979, Ser. No. 35,532
Int. Cl.[3] C01G *5/02*; C01C *3/20*
U.S. Cl. 423—27 **21 Claims**

1. A process for the recovery of silver as silver halide or silver pseudohalide from waste photographic paper, photographic film and other sensitized materials which comprises washing the material, removing wash, bringing the silver present to a form solubilizable in concentrated halide or pseudohalide solution by oxidation if necessary, dissolving the silver salt or salts by means of a concentrated reagent solution of the halide or pseudohalide of an alkali or alkaline-earth metal, or ammonium, separating said complex solution from solid matter, washing the solid in turn with a dilute solution of the halide or pseudohalide, and then with water, treating said separated complex solution with said dilute halide or pseudohalide wash and wash water combined to form a precipitate, and separating the precipitate of said silver halide or pseudohalide, reconcentrating dilute reagent, separating unwanted accumulated salts from reagent and purifying said silver salt.

4,256,705

LEACHING AGGLOMERATED GOLD - SILVER ORES

Harold J. Heinen, Reno; Gene E. McClelland, Sparks, and Roald E. Lindstrom, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 29,953, Apr. 13, 1979, abandoned. This application Apr. 17, 1980, Ser. No. 141,087
Int. Cl.[3] C01G *5/00, 7/00*
U.S. Cl. 423—27 **7 Claims**

1. A process for percolation leaching of gold or silver values from a feed material consisting of ores, tailings or wastes comprising:

(1) admixing the feed with about 0.25 to 0.75 weight percent of a binding agent consisting of lime, portland cement, or mixtures thereof, and about 8 to 16 weight percent of water,

(2) mechanically manipulating the admixture to effect agglomeration of fines in the feed,

(3) aging the admixture at ambient conditions for a time sufficient to provide the resulting agglomerates with green strength sufficient to withstand further wetting without disintegration, and

(4) subjecting the aged admixture to percolation leaching with a leach solution for gold or silver.

4,256,706

LEACHING AGGLOMERATED GOLD - SILVER ORES

Harold J. Heinen, Reno; Gene E. McClelland, Sparks, and Roald E. Lindstrom, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 29,952, Apr. 13, 1979, abandoned, and Ser. No. 29,953, Apr. 13, 1979, abandoned. This application Apr. 17, 1980, Ser. No. 141,088
Int. Cl.[3] C01G *5/00, 7/00*
U.S. Cl. 423—29 **7 Claims**

1. A process for percolation leaching of gold or silver values from a feed material consisting of ores, tailings or wastes comprising:

(1) admixing the feed with about 0.25 to 0.75 weight percent of a binding agent consisting of lime, portland cement, or mixtures thereof, and about 8 to 16 weight percent of an aqueous cyanide solution,

(2) mechanically manipulating the admixture to effect agglomeration of fines in the feed,

(3) aging the admixture at ambient conditions for a time sufficient to provide the resulting agglomerates with green strength sufficient to withstand further wetting without disintegration, and for substantial reaction of the cyanide with gold or silver values in the feed, and

(4) subjecting the aged admixture to percolation leaching with water or cyanide solution, whereby gold or silver is selectively leached.

4,256,707

SELECTIVE REMOVAL OF MERCURY FROM CYANIDE SOLUTIONS

Charles M. Flynn, Jr., Reno; Thomas G. Carnahan, Sparks, and Roald E. Lindstrom, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 24, 1979, Ser. No. 87,852
Int. Cl.[3] C01G *13/00*; C01C *3/08*
U.S. Cl. 423—42 **5 Claims**

1. A method for the selective removal of mercury from gold cyanide solutions comprising the steps of:

(a) admixing a reactive metal sulfide selected from the group

consisting of freshly precipitated Ag_2S, ZnS or FeS with said solution to form an insoluble mercuric sulfide precipitate and a substantially mercury-poor solution; and

(b) separating said mercuric sulfide precipitate from said substantially mercury-poor solution.

4,256,708

PROCESS FOR RECOVERING TUNGSTEN FROM CEMENTED TUNGSTEN CARBIDE

Lucretia R. Quatrini, Athens, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 26, 1979, Ser. No. 107,232
Int. Cl.[3] C01G *41/00*
U.S. Cl. 423—61 1 Claim

1. In a process for recovering tungsten from cemented tungsten carbide including cobalt as a cementing material wherein the cemented tungsten carbide is oxidized to form an oxidized product which is digested in an aqueous solution of an alkali metal hydroxide to form a water soluble alkali metal tungstate portion and an insoluble portion, the improvement comprising digesting with (in) an aqueous solution comprising about 20 to about 40 percent alkali metal hydroxide and in the presence of an excess of the theoretical amount of titanium dioxide needed to react with cobalt to form cobalt titanate, said digestion being carried out at a temperature greater than about 140° C. and a pressure greater than about 50 pounds per square inch to promote the formation of a soluble alkali metal tungstate.

4,256,709

METHOD FOR THE PRODUCTION OF ALUMINA

Viktor M. Sizyakov, ulitsa Vavilovykh, 7, korpus 3, kv. 94; Leonid F. Bilenko, Grazhdansky prospekt, 83, korpus 1, kv. 48; Nikolai S. Shmorgunenko, V.O., 1 linia, 28, kv. 15, all of Leningrad; Leonid I. Finkelshtein, ulitsa Chkalova, 45, kv. 2, Krasnoyarsky krai, Achinsk; Georgy P. Tkachenko, Slavyansky bulvar, 43, kv. 221, Moscow; Oleg V. Alexeev, 6 mikroraion, 11, kv. 63, Krasnoyarsky krai, Achinsk; Vitaly L. Aronzon, ulitsa Ivana Chernykh, 21, kv. 2, Leningrad; Pavel S. Vladimirov, ulitsa Olgi Forsh, 1, kv. 247, Leningrad; Alexei I. Alexeev, prospekt Solidarnosti, 9, korpus 2, kv. 155, Leningrad, and Ivan M. Kostin, ulitsa Lensoveta, 60, kv. 63, Leningrad, all of U.S.S.R.

Filed Jun. 8, 1979, Ser. No. 46,755
Int. Cl.[3] C01F *7/04*
U.S. Cl. 423—119 2 Claims

1. In a method for the production of alumina which comprises forming a mixture by mixing and grinding an alkaline aluminosilicate raw material, limestone and a soda containing solution, correcting the mixture to obtain therein molecular ratios of $CaO:SiO_2$ of 2 ± 0.03 and $Na_2O:(Al_2O_3+Fe_2O_3)$ of about 1, heating the corrected mixture at a temperature of, 1250° to 1300° C. to form a sinter, leaching the sinter to form an aluminate solution, desilicating the aluminate solution, carbonating the desilicated aluminate solution to form aluminum hydroxide, and calcining the aluminum hydroxide to form alumina the improvement which comprises:

(a) Comminuting the alkaline aluminosilicate with an aqueous soda containing solution in an amount to form a mixture containing from 30 to 50 percent water by weight to form a comminuted mixture wherein the weight fraction of particles larger than 0.08 mm is greater than 20 percent;

(b) mixing the comminuted mixture with limestone and additional soda solution to form a mixture having molecular ratios of $CaO:SiO_2$ of 2 ± 0.03 and $Na_2O:(Al_2O_3+Fe_2O_3)$ of about 1

(c) comminuting the mixture formed in step (b) until the fraction of particles larger than 0.08 mm is from 2 to 15 percent by weight and

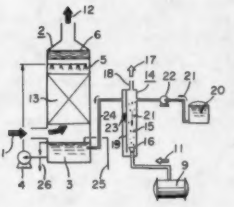
(d) heating the mixture of step (c) to form the sinter.

4,256,710

PROCESS FOR DEODORIZATION

Kenkoku Azuma, and Akira Ikeda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 79,196
Claims priority, application Japan, Nov. 1, 1978, 53/134906
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—210 11 Claims



1. A process for deodorization of a gas containing bad smell substances comprising bubbling an ozone-containing gas through an aqueous solution of an alkali bromide in a bubbling vessel, to obtain a washing solution containing from about 0.10 g per liter to about 0.65 g per liter BrO^- and contacting the gas with the washing solution in a wash tower.

4,256,711

CATALYSIS

Paul A. Sermon, Cowley, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 826,831, Aug. 22, 1977, abandoned.
This application Oct. 4, 1978, Ser. No. 948,508
Claims priority, application United Kingdom, Aug. 24, 1976, 35202/76
Int. Cl.[3] B01D *53/36*
U.S. Cl. 423—239 1 Claim

1. A method for the decomposition of NO present in a gas stream which comprises contacting the gas with a catalyst consisting essentially of TiN.

4,256,712

REGENERABLE PROCESS FOR SO_2 REMOVAL EMPLOYING GELATINOUS ALUMINUM HYDROXIDE AS ABSORBENT

Richard S. Atkins, Freehold, and Asim B. Ray, Bridgewater, both of N.J., assignors to Research-Cottrell, Inc., Bridgewater Township, Somerset County, N.Y.

Filed Jun. 6, 1978, Ser. No. 913,093
Int. Cl.[3] C01B *17/00, 17/02*
U.S. Cl. 423—242 17 Claims

1. A continuous absorption-regenerative process for removing SO_2 from a gas comprising contacting said gas in a first zone with an aqueous suspension of an absorbent consisting essentially of gelatinous aluminum hydroxide whereby the SO_2 is absorbed by said gelatinous aluminum hydroxide, withdrawing a portion of said aqueous suspension of gelatinous aluminum hydroxide containing absorbed SO_2 heating said portion of aqueous suspension in a second zone while sparging with a gas to evolve SO_2 therefrom and to convert said absorbent to suspended gelatinous aluminum hydroxide and recycling said regenerated aqueous suspension of gelatinous aluminum hydroxide to said first zone.

4,256,713

FLUE GAS TREATMENT WITH INTERMITTENT ADDITION OF ALKALINE REAGENT TO SCRUBBING LIQUOR

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 30, 1979, Ser. No. 71,216
Int. Cl.[3] C01B *17/00*
U.S. Cl. 423—242 5 Claims

1. In a process for the absorptive removal of sulfur dioxide from a gaseous mixture by contacting said gaseous mixture in a scrubbing zone with a scrubbing liquor comprising a buffered solution of an alkali metal sulfite and bisulfite, the alkalinity of said scrubbing liquor being maintained by the addition thereto of an aqueous alkaline reagent solution comprising sodium carbonate, sodium bicarbonate or both having a relatively high pH with respect to said scrubbing liquor, said aqueous alkaline reagent solution having dissolved therein an undesirable quantity of silica contaminant which, upon the addition of said aqueous alkaline reagent solution to said scrubbing liquor, tends to precipitate from solution and form deleterious deposits which interfere with the functioning of said process, the improvement which comprises the minimization of said deleterious deposits by effecting said addition of said aqueous alkaline reagent solution to said scrubbing liquor in a cyclic intermittent manner, whereby as the pH of said scrubbing liquor falls to a specific minimum value of not less than about 6.5 no addition of said aqueous alkaline reagent solution is made, upon said pH reaching said minimum value of not less than about 6.5 said addition is initiated and continued at a rate sufficient to effect the rapid rise of said pH to a specific maximum value of not greater than about 10.5, upon said pH reaching said maximum value of not greater than about 10.5 said addition is discontinued and said pH again falls to said minimum value of not less than about 6.5 to complete one phase of said cycle.

4,256,714

BASIC ALUMINUM NITRATE CRYSTALLIZATION

Charles E. Scott, and John L. Dewey, both of Little Rock, Ark., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jul. 27, 1979, Ser. No. 61,296
Int. Cl.[3] C01F *7/66*
U.S. Cl. 423—295 11 Claims

1. A process for preparing large crystals of basic aluminum nitrate from a nitric acid feed solution containing Al_2O_3 comprising the steps of:

(a) evaporating water and nitric acid from the feed solution in a single step evaporation performed at a temperature of between about 270° and about 450° F. and at a pressure of between about atmospheric and about 60 psig to produce an evaporated liquor comprising at least about 16% alumina by weight;

(b) holding the evaporated liquor in a quiescent state for a period of between about 20 minutes and about two hours at a temperature of between about 270° F. and about 350° F.;

(c) injecting water into the product of step b to induce crystallization, the water being added in an amount sufficient to adjust the composition of the conditioned liquor to a composition expressible as the sum of two components

(1) Aluminum nitrate nonahydrate, and

(2) the selected crystal product of hydrated basic aluminum nitrate; and

(d) separating the large crystals.

4,256,715

PROCESS FOR PREPARING CRYSTALLINE PHOSPHONITRILIC CHLORIDE OLIGOMERS

Tsukuru Kinoshita; Yuzuru Ogata, and Masayoshi Suzue, all of Tokushima, Japan, assignors to Otsuka Chemical Co., Ltd., Osaka, Japan

Filed Nov. 29, 1978, Ser. No. 964,458
Claims priority, application Japan, May 4, 1978, 53/53380
Int. Cl.[3] C01B *25/10*
U.S. Cl. 423—300 5 Claims

1. In a process for preparing crystalline phosphonitrilic chloride oligomers by reacting phosphorus pentachloride with ammonium chloride in an organic solvent inert to chlorine in the presence of a catalyst, the improvement which comprises adding dropwise phosphorus trichloride to a dispersion of ammonium chloride and said catalyst in an organic solvent at a rate of 0.003 to 0.07 mole/minute per mole of ammonium chloride simultaneously with the supply of an equimolar amount of chlorine gas based on said phosphorus trichloride at the same rate as the addition rate of said phosphorus trichloride at a temperature of 100° to 200° C. to produce said phosphorus pentachloride, said catalyst being at least one member selected from the group consisting of oxides of metals of Groups II-A, II-B, III-A, IV-A, IV-B and VIII of the Periodic Table; sulfides of metals of Groups II-A and II-B of the Periodic Table, fatty acid salts of metals of Groups II-A and II-B of the Periodic Table, acetylacetonatomagnesium, acetylacetonatozinc, organometallic compounds of metals of Groups II-A and II-B of the Periodic Table, peroxides of metals of Groups II-A and II-B of the Periodic Table, hydroxides of metals of Groups III-A and VIII of the Periodic Table and magnesium hydroxide; and said catalyst being employed in an amount of 0.01% to 10% by weight based on the weight of the phosphorus trichloride.

4,256,716

PROCESS FOR TREATING LOADED EXTRACTANT FROM PURIFICATION OF PHOSPHORIC ACID BY EXTRACTION

Subhas K. Sikdar, San Juan Capistrano, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Mar. 1, 1979, Ser. No. 16,651
Int. Cl.[3] C01B *25/16*
U.S. Cl. 423—321 S 6 Claims

1. In a process for purifying an aqueous phosphoric acid containing P_2O_5 values and dissolved ionic impurities comprising magnesium, iron and aluminum ions, wherein (a) said phosphoric acid is contacted with an organic extractant containing a water-immiscible organic sulfonic acid to form: a loaded organic extractant containing the organic sulfonic acid, extracted ionic metallic impurities and extracted P_2O_5 values, and a purified aqueous phosphoric acid; (b) the purified aqueous phosphoric acid is separated from the loaded organic extractant to provide a separated organic extractant; and (c) the organic extractant is regenerated from the separated organic extractant for recycle to step (a); the improvement comprising;

(i) contacting said separated organic extractant from step (b) with a solution containing calcium ions obtained from dissolving a member selected from calcium chloride and calcium nitrate, under conditions whereby at least some of said extracted ionic metallic impurities are replaced by calcium and are transferred to said solution; and

(ii) separating said solution from the contacted organic extractant.

4,256,717

SILICON PURIFICATION METHOD

Robert K. Dawless, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 24, 1979, Ser. No. 41,892
Int. Cl.[3] B01D 9/00; C01B 33/02
U.S. Cl. 423—348 14 Claims

1. A method for providing a bed of purified silicon crystals wherein silicon is crystallized from a solvent metal and the amount of solvent metal remaining in the crystal bed is reduced to a low level, the method comprising the steps of:

(a) providing a molten body containing silicon and at least one metal selected from the group consisting of tin, zinc, aluminum, silver and lead, the silicon being present in an amount greater than the eutectic point of the silicon-metal combination, the metal adapted to act as a solvent for the silicon;

(b) extracting heat from the body to provide a solid phase containing silicon in crystal form and to concentrate impurities in a molten phase;

(c) thereafter, removing a substantial part of the molten phase from the solid phase containing said silicon crystals;

(d) subjecting the solid phase to a melting action to melt a fraction of the solid phase for purposes of removing a substantial amount of metal-silicon combination adhering to said crystals; and

(e) draining the molten phase from the solid phase to separate at least a fraction of the metal-silicon combination adhering to said crystals of silicon.

4,256,718

SODIUM ZIRCONIUM CARBONATE COMPOUND AND THE METHOD OF ITS PREPARATION

Mary J. McArthur, Simi Valley; Laurence B. Marantz, Sherman Oaks, and Abb L. Scarbrough, Calabasas, all of Calif., assignors to Organon Teknika Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 890,650, Mar. 20, 1978, abandoned. This application Jan. 24, 1979, Ser. No. 5,671
Int. Cl.[3] C01B 31/24; C01D 7/00; C01G 25/00
U.S. Cl. 423—419 P 38 Claims

4. A particulate non-crystalline, substantially water insoluble sodium zirconium carbonate hydrate product having a substantially uniform particle size and which, after drying at 70° C. for two hours, is a hexahydrate having an index of refraction of from about 1.64 to about 1.67, said product having an ionic composition corresponding to analysis, exclusive of water of hydration, of:

$$(Na)_A(Zr)_B(CO_3)_C$$

wherein, when B, determined as ZrO_2, is assigned the 1, A has a value of from about 0.8 to 1.2, and C, determined as CO_2, has a value of from about 0.8 to about 1.2 and said product being formed by the process comprising the steps of:

(a) preparing a metastable solution comprising zirconium, sodium, sulfate and carbonate ions and having a pH of from about 8 to about 11.5, the molar ratios of said sodium, sulfate and carbonate ions to each zirconium ion being within the ranges of from about 6 to about 10, from about 2 to about 3 and from about 2 to about 4 respectively and the concentration of said zirconium ions in said solution being from about 0.3 molar to about 0.9 molar, wherein said solution may further comprise chloride ions which when present do not exceed a molar ratio of about 2 chloride ions to one zirconium ion;

(b) heating said metastable solution to greater than about 90° C.; and,

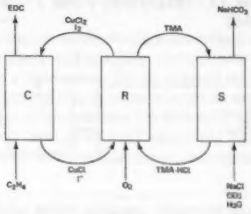
(c) holding said solution at greater than about 90° C. for sufficient time to allow formation of said product.

4,256,719

PROCESS FOR THE COMBINED MANUFACTURE OF CHLORINATED HYDROCARBONS AND SODIUM BICARBONATE

Eleonoor van Andel, Enschede, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jan. 9, 1980, Ser. No. 110,767
Claims priority, application Netherlands, Jan. 10, 1979, 7900183
Int. Cl.[3] C01D 7/00, 15/08; C07C 17/02, 17/10
U.S. Cl. 423—424 5 Claims



1. A process for the combined manufacture of chlorinated hydrocarbons and sodium bicarbonate comprising the steps of

a. chlorinating an olefinic hydrocarbon with a substantially non-aqueous chlorinating liquid containing iodine and a chloride of a polyvalent metal in the oxidized state,

b. converting sodium chloride by carbonatation into sodium bicarbonate with the aid of a volatile base according to the Solvay-soda method,

c. using the hydrogen chloride adduct of the volatile base resulting from step b. as the chlorine source in the oxidative regeneration of the spent chlorinating liquid of step a.,

characterized in that the polyvalent metal in the chlorinating liquid is copper and/or iron, the volatile base in step b. is an aliphatic amine having a boiling point below about 100° C. and its hydrochloride adduct is the chlorine source in step c., the amine being recovered in the vapor phase and returned to the soda process of step b.

4,256,720

METHOD FOR PRODUCING CARBON BLACK

Robert H. Kallenberger, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 12, 1979, Ser. No. 19,947
Int. Cl.[3] C01B 31/02; C09C 1/48
U.S. Cl. 423—449 15 Claims

1. A method for producing carbon black comprising the steps of:

contacting hot combustion gases and a carbonaceous feed in a reaction zone to thereby convert said carbonaceous feed to a production carbon black;

combining a rerun carbon black, having a CTAB number which does not meet predetermined specifications, with said production carbon black to thereby produce a combined carbon black product;

establishing a first signal representative of the flow rate (F_{PC}) of said production carbon black;

establishing a second signal representative of the flow rate (F_{RC}) of said rerun carbon black;

establishing a third signal representative of the CTAB number ($CTAB_P$) of said production carbon black;

establishing a fourth signal representative of the CTAB number ($CTAB_R$) of said rerun carbon black;

establishing a fifth signal representative of the CTAB number ($CTAB_{PROD}$) of said combined carbon black product in response to said first, second, third and fourth signals;

establishing a sixth signal representative of the desired CTAB number for said combined carbon black product;

establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

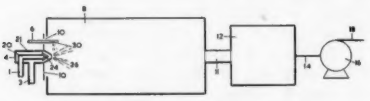
controlling the flow rate of said carbonaceous feed to said reaction zone in response to said seventh signal to thereby maintain a desired CTAB number for said combined carbon black product.

4,256,721

COMBUSTION METHOD AND APPARATUS

Philip G. Blakey, Riddings, and Richard W. Watson, Allestree, both of England, assignors to BOC Limited, London, England

Filed Feb. 23, 1979, Ser. No. 14,674
Int. Cl.[3] C01B *17/50, 17/90, 17/74*
U.S. Cl. 423—540 **4 Claims**



1. A process of thermally cracking waste sulphuric acid to produce sulphur dioxide comprising

(a) supplying a stream of waste sulphuric acid to a first passage of a burner in communication with a combustion chamber, the sulphuric acid having dissolved therein or mixed therewith combustible matter;

(b) supplying a stream of atomising air to a second passage in the burner so as to atomise the sulphuric acid and combustible matter;

(c) supplying a stream of secondary air to the combustion chamber separately from the burner so as to provide an oxygen containing atmosphere in the vicinity of the flame issuing from the burner in operation of the burner;

(d) initiating combustion of the combustible matter so as to generate the heat necessary for said thermal cracking;

the improvement comprising

(e) injecting oxygen or an oxygen gas mixture containing at least 35% oxygen by volume into the combustion chamber separately from the burner and into direct contact with a flame issuing from the burner in operation of the burner.

4,256,722

PROCESS FOR PRODUCING POROUS SPINEL MATERIALS

Gerald B. Carrier, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,487
Int. Cl.[3] C01G *49/00, 37/14;* **C01F** *7/04*
U.S. Cl. 423—594 **6 Claims**

1. A method for preparing porous bodies consisting essentially of spinel and/or crystals isostructural with spinel having an average pore size between about 450–700 A, about 80% of said pores being within about ±25% of the average pore size, and having a surface area between about 10–75 meters^2/gram, said crystals having the general formula $AO.B_2O_3$ wherein A represents a divalent metal ion and B represents a trivalent metal ion, which comprises the steps of:

(a) impregnating a porous, trivalent metal ion-containing material having a surface area between about 50–500 meters^2/gram, said trivalent metal ion being selected from the group of Al^{+3}, Fe^{+3}, and Cr^{+3}, with a solution of a divalent metal ion-containing compound, said divalent metal ion being selected from the group of Mg^{+2}, Fe^{+2}, Mn^{+2}, and Zn^{+2}, which compound, upon pyrolysis, will be converted to the respective oxide or other compound capable of reacting with said trivalent metal ion-containing material, said divalent metal ion-containing compound being present in a quantity sufficient to produce an amount of the corresponding divalent metal oxide or other compound ranging from about, by weight, 5% below to about 10% above that required to stoichiometrically react with said trivalent metal ion-containing material;

(b) drying the impregnated material; and

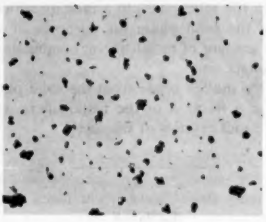
(c) firing the dried material at a temperature of at least 800° C., but not higher than about 1250° C., for a period of time sufficient to cause essentially complete reaction between said trivalent metal ion-containing material and said divalent metal ion-containing material to form spinel and/or crystals isostructural with spinel.

4,256,723

PROCESS FOR PREPARING PRECIPITATED RED IRON OXIDES

Eugene M. Urban, Jr., Trenton, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed May 3, 1979, Ser. No. 35,667
Int. Cl.[2] C01G *49/06*
U.S. Cl. 423—633 **2 Claims**



1. A process for the preparation of red iron oxide crystals containing a minimum of acicular yellow iron crystals, said process comprising the serial steps of:

(a) adding, with agitation, an aqueous solution of a soluble ferrous salt to an aqueous solution containing an excess of a stoichiometric equivalent of a base selected from the hydroxides and carbonates of sodium and potassium, thus forming an insoluble iron compound, with the mixture having a pH of about 7.5 and a temperature of from about 55° C. to about 75° C. (131° F.–167° F.),

(b) aerating the mixture with an oxygen-containing gas, at a rate of from about 0.001 to about 0.005 lbs. O_2/min./lb. of added ferrous salt, to oxidize the precipitate of step (a) to uniformly-sized and highly uncrystalline iron oxide seed particles,

(c) aerating the mixture at the rate given in step (b) for a substantially complete reaction period of from about 1 to about 4 hours, at which time essentially all the ferrous iron has been converted to ferric iron, and the pH has increased to approximately 9,

(d) increasing the temperature to a range of about 80°–90° C. (176°–194° F.),

(e) adding additional soluble ferrous salt in an amount in excess of that required to react with the excess base present, thus lowering the pH of the mixture from approximately 9 to about 6,

(f) aerating the mixture of step (e) with an oxygen-containing, gas, at a rate of about 0.0005 to about 0.001 lbs. O_2/min./lb. of additional iron salt from step (e), for a period of about 10–20 hours, thus converting essentially all the precipitated ferrous iron to ferric iron, resulting in the formation of iron oxide crystals having a color of light salmon, a low acicularity, a high crystallinity, a uniform particle size, and purity of color, and the reduction of the pH to about 4

(g) and optionally growing the iron oxide crystals of step (f) to a darker shade of color.

4,256,724

METHOD FOR NON-COVALENT COATING OF ANTIBODIES ON SOLID SUBSTRATES

Herman Rutner, Hackensack, N.J., and Thomas F. Dodd, Bronx, N.Y., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Feb. 21, 1978, Ser. No. 879,801
Int. Cl.[2] G01N *33/16;* B01J *1/22;* A61K *39/00*
U.S. Cl. 424—1 31 Claims

1. A process for coating an antibody on a solid substrate, comprising:

contacting a solid substrate with antibody solution, said antibody being at least one member selected from the group consisting of antibodies to lipophilic haptens and antibodies to lipophilic antigens, said solution having at least one salt dissolved therein to provide a solution having an ionic strength of at least 0.5 and no greater than 10.0; and separating said solution and said solid substrate to provide said solid substrate coated with said antibody.

4,256,725

PREPARATION OF SOLID SUBSTRATE CONTAINING RECEPTOR AND LABELED FORM OF LIGAND FOR ASSAYS

Herman Rutner, Hackensack, N.J., and Thomas F. Dodd, Bronx, N.Y., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Feb. 21, 1978, Ser. No. 879,902
Int. Cl.[2] G01N *33/16;* B01J *1/22;* A61K *39/00*
U.S. Cl. 424—1 20 Claims

1. A process for preparing an article suitable for use in a solid phase assay, comprising:

contacting a solid substrate with a mixture of the labeled form of a ligand to be assayed, a receptor for the ligand and a solution of an ionic salt having an ionic strength of at least 0.5, and no greater than 10.0 whereby the receptor and labeled form of the ligand are placed on the solid substrate, said labeled form of the ligand being reversibly placed on the solid substrate, whereby during an assay for the ligand, the labeled form of the ligand is available for equilibration with the receptor in competition with the ligand to be assayed.

4,256,726

^{99m}TC-LABELED RADIOACTIVE DIAGNOSTIC AGENT, AND NON-RADIOACTIVE CARRIER THEREFOR

Makoto Kato, and Masaaki Hazue, Mukomotomachi, both of Japan, assignors to Nihon Medi+Physics Co., Ltd., Hyogo, Japan

Filed May 1, 1978, Ser. No. 901,605
Claims priority, application Japan, May 7, 1977, 52/52427
Int. Cl.[2] A61K *29/00, 43/00*
U.S. Cl. 424—1 6 Claims

5. A ^{99m}Tc-labeled radioactive diagnostic agent which comprises ^{99m}Tc in the form of a pertechnetate and a non-radioactive carrier comprising pyridoxal or a salt thereof, a stannous salt and an α-amino acid not having any hydrophilic functional group dissolved in an aqueous medium.

4,256,727

SYNTHESIS AND USE OF DIAGNOSTIC RADIO-PHARMACEUTICALS COMPRISING RADIOACTIVE ISOTOPES OF BROMINE WITH DYES

John W. Triplett, and Randall B. Smith, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Sep. 18, 1978, Ser. No. 943,555
Int. Cl.[3] A61K *49/00, 43/00;* G01T *33/48, 1/00*
U.S. Cl. 424—1.5 11 Claims

5. A process for imaging the liver or biliary tract of a patient comprising the steps of:

intravenously injecting the patient with a dye selected from the group consisting of triarylmethane dyes and the phthalein subclass of the class of xanthene dyes, said dye being labelled with a gamma-emitting isotope of bromine; and then scintigraphically imaging the liver or biliary tract of the patient.

4,256,728

DEODORIZATION METHOD

Hiroshi Nishino, Osaka; Toshio Aibe, Toyonaka, and Fumiichi Ogino, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 11, 1979, Ser. No. 83,948
Claims priority, application Japan, Oct. 11, 1978, 53-125436
Int. Cl.[3] A61L *9/00*
U.S. Cl. 422—4 5 Claims

1. A deodorization method which comprises allowing a gas containing as main bad-smelling components (a) hydrogen sulfide and/or a mercaptan, (b) an organic sulfide and/or an organic disulfide and (c) ammonia and/or an amine to contact (1) firstly with activated carbon, (2) then with activated carbon or clay mineral having an acid supported thereon, and (3) subsequently with activated carbon in the presence of chlorine or bromine.

4,256,729

N,N'-BIS-(2,3-DIHYDROXYPROPYL)-2,4,6-TRIIODO-5-(2-KETO-L-GULONAMIDO)ISOPHTHALAMIDE AND RADIOLOGICAL COMPOSITIONS CONTAINING SAME

Youlin Lin, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 23, 1979, Ser. No. 23,509
Int. Cl.[3] A61K *49/04*
U.S. Cl. 424—5 6 Claims

1. N,N'-Bis-(2,3-dihydroxypropyl)-2,4,6-triiodo-5-(2-keto-L-gulonamido)isophthalamide.

2. A radiological composition containing N,N'-bis-(2,3-dihydroxypropyl)-2,4,6-triiodo-5-(2-keto-L-gulonamido)isophthalamide in a sufficient amount to provide satisfactory X-ray visualization together with a pharmaceutically acceptable radiological vehicle.

3. In a method for X-ray visualization wherein a radiological composition containing an X-ray contrast agent in a pharmaceutically acceptable radiological vehicle is injected in a sufficient amount to provide adequate visualization and thereafter x-ray visualization carried out, the improvement comprising utilizing as the radiological composition a composition containing N,N'-bis-(2,3-dihydroxypropyl)-2,4,6-triiodo-5-(2-keto-L-gulonamido)isophthalamide in a sufficient amount to provide satisfactory X-ray visualization together with a pharmaceutically acceptable radiological vehicle.

5. N,N'-Bis-(2,3,-dihydroxypropyl)-5-(2,3:4,6-di-O-isopropylidene-2-keto-L-gulonamido)-2,4,6-triiodoisophthalamide.

4,256,730

ORAL COMPOSITIONS

James J. Benedict, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 24, 1978, Ser. No. 936,452
Int. Cl.[3] A61K *7/16;* A67K *7/18*
U.S. Cl. 424—52 10 Claims

1. A toothpaste consisting essentially of:

(A) from about 0.05% to about 0.80% by weight of 6-methyloxathiazinone dioxide or an alkali metal or alkaline earth salt thereof as a sweetening agent;

(B) from about 0.5% to about 95% by weight of an abrasive material;

(C) from about 0.5% to about 5.0% of a sudsing agent;

(D) from about 0.1% to about 5.0% of a binder material;

(E) up to about 50% of a humectant material;

(F) from about 0.01% to about 1.0% of a water-soluble fluorine-containing compound; and

(G) balance, water and minors.

(B) from about 0.5% to about 95% by weight of an abrasive material;

4,256,731
ORAL COMPOSITIONS

Stephen N. Curtis, Edison, and Hridaya N. Bhargava, East Brunswick, both of N.J., assignors to Beecham, Inc., Clifton, N.J.

Division of Ser. No. 889,205, Mar. 23, 1978. This application Oct. 26, 1979, Ser. No. 88,575
Int. Cl.[3] A61K *7/22, 7/24*
U.S. Cl. 424—54 **24 Claims**

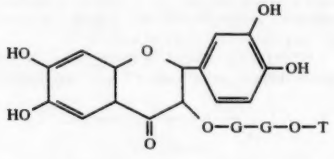
1. In an oral composition for controlling dental plaque and gingivitis and for preventing caries which comprises from 0.01% to about 1.0% w/v of a cationic antimicrobial agent useful for controlling dental plaque and gingivitis and for preventing caries selected from the group having a tendency to stain teeth consisting of a bisbiguanide and a quaternary ammonium compound, the improvement which comprises from 0.1% to 3.5% of a composition which comprises an effective amount of a nonionic surfactant exhibiting anti-stain characteristics and an effective amount of a member selected from the group consisting of an amino acid exhibiting anti-stain characteristics, a dicarboxylic acid and a tricarboxylic acid or a mixture thereof which exhibits anti-stain characteristics said member being present in a molar excess of about 10:1 to about 20:1 over the cationic anti-microbial agent.

4,256,732
MODIFIED GRASS POLLEN ANTIGENS

Arthur Malley, Beaverton, Oreg., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 933,907, Aug. 15, 1978. This application Sep. 25, 1979, Ser. No. 78,813
Int. Cl.[3] A61K *39/36*
U.S. Cl. 424—91 **14 Claims**

1. An immunotherapeutic method for treating grass pollen allergies comprising administering to an individual an amount of a modified grass pollen antigen sufficient to induce suppressor T-cells that will result in a suppression of allergic antibodies to grass pollen antigen, said modified antigen being the product of a method comprising subjecting a quercitin moiety containing grass pollen antigen or fragment thereof having the structure:

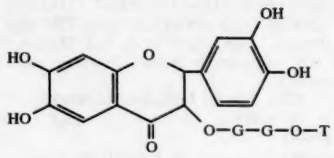


wherein:

G represents glucose, and

T represents threonine or a poly-peptide linked to said structure through a threonine molecule; to oxidative conditions such that the said dihydroxy aromatic rings undergo rearrangement and ring scission without substantially modifying said threonine or polypeptide to yield a product substantially devoid of antigenic properties but capable of activating T-cells and inducing T_s cells.

8. An immunotherapeutic composition suitable for inhibiting allergic reactions in humans and lower animals comprising a modified grass pollen antigen and an inert carrier therefor in unit dosage form, said modified antigen being the product of a method comprising subjecting a quercitin moiety containing grass pollen antigen or fragment thereof having the structure:



wherein:

G represents glucose, and

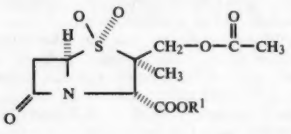
T represents threonine or a poly-peptide linked to said structure through a threonine molecule; to oxidative conditions such that the said dihydroxy aromatic rings undergo rearrangement and ring scission without substantially modifying said threonine or polypeptide to yield a product substantially devoid of antigenic properties but capable of activating T-cells and inducing T_s cells.

4,256,733
ACETOXYMETHYL PENAM COMPOUNDS AS β-LACTAMASE INHIBITORS

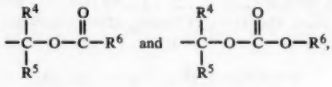
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 26, 1979, Ser. No. 79,127
Int. Cl.[3] C07D *499/00;* **A61K** *31/43*
U.S. Cl. 424—114 **22 Claims**

1. A penam compound of the formula



and the pharmaceutically-acceptable base salts thereof, wherein R^1 is selected from the group consisting of hydrogen 3-phthalidyl, 4-crotonolactonyl, gamma-butyrolacton-4-yl,



wherein R^4 and R^5 are each selected from the group consisting of hydrogen and methyl, and R^6 is alkyl having from 1 to 5 carbon atoms.

4,256,734
METHOD FOR MAKING ROAD SURFACE COATINGS

Rene Smadja, 1, E. rue di la Pommeray, 76 Notre Dame de Gravenchon, France

Filed Mar. 21, 1977, Ser. No. 779,386
Claims priority, application France, Nov. 4, 1976, 76 33304
Int. Cl.[3] B05D *5/10;* **E01C** *5/12*
U.S. Cl. 427—139 **4 Claims**

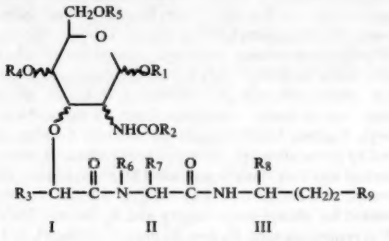
1. In a method for making road surface coatings from an asphalt binder and chippings mixed therewith, followed by compaction, the improvement wherein the asphalt binder is foamed utilizing a fluorinated hydrocarbon as an expansion agent and is in the form of a foam when the chippings are spread out and the thickness of said foam during such operation is substantially equal to the maximum dimension of the chippings.

4,256,735
IMMUNOLOGICALLY ACTIVE DIPEPTIDYL SACCHARIDES AND METHODS OF PREPARATION

Philippe L. Durette, New Providence, and Tsung-Ying Shen, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 29, 1979, Ser. No. 7,108
Int. Cl.[3] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **14 Claims**

1. Immunostimulatory 2-amino-2-deoxy-glycoses of the general structural formula:



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provided said glycose is not 2-amino-2-deoxy-D-glucose, wherein

R_1 is hydrogen, alkyl of 1 to 7 carbon atoms optionally substituted by hydroxy, mercapto, alkoxy of 1 to 3 carbon atoms, alkyl mercapto of 1 to 3 carbon atoms, hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms, halogen, carboxyl, carboxyl esterified by an alcohol of 1 to 3 carbon atoms, or amidated carboxyl,

phenyl, benzyl each optionally substituted by alkyl of 1 to 3 carbon atoms, lower alkyldioxy, amino, trifluoromethyl, hydroxy, mercapto, hydroxy or mercapto etherified by alkyl of 1 to 3 carbon atoms, or hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms;

R_2 is alkyl of 1 to 7 carbon atoms optionally substituted by hydroxy, mercapto, alkoxy of 1 to 3 carbon atoms, alkyl mercapto of 1 to 3 carbon atoms, hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms, halogen, carboxyl, carboxyl esterified by an alcohol of 1 to 3 carbon atoms, or amidated carboxyl,

phenyl, optionally substituted by alkyl of 1 to 3 carbon atoms, lower alkyldioxy, amino, trifluoromethyl, hydroxy, mercapto, hydroxy or mercapto etherified by alkyl of 1 to 3 carbon atoms, or hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms;

R_3 is H or alkyl of 1 to 10 carbon atoms;

R_4 and R_5 are same or different and are

hydrogen

alkanoyl of 2 to 21 carbon atoms,

benzoyl, naphthoyl-1 or naphthoyl-2 each optionally substituted by halogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl, hydroxy or alkanoyloxy of 1 to 3 carbons,

an alkanesulfonic acid of 1 to 7 carbon atoms, or a phenylsulfonic acid optionally substituted by alkyl of 1 to 3 carbon atoms,

carbamoyl, alkyl carbamoyl of 1 to 3 carbon atoms, phenylcarbamoyl or napththylcarbamoyl; R_6 is H or R_6–R_7 together is $—CH_2—CH_2—CH_2—$; R_7 is H, alkyl of 1 to 7 carbon atoms, hydroxymethyl,

mercaptomethyl, benzyl; or substituted benzyl wherein the substituents are the same as defined for R_1; R_8 and R_9 each is carboxyl, esterified carboxyl of 1 to

7 carbon atoms, amidated carboxyl, or mono- or dialkyl amidated carboxyl wherein the alkyl group has 1 to 3 carbon atoms; provided that when R_3 is lower alkyl, the stereochemistry at asymmetric center I can be either D or L, when R_7 is not H, the stereochemistry at asymmetric center II is either L or D, and the stereochemistry at asymmetric center III is D.

14. An antibacterial composition comprising an antibacterially effective amount of a compound of claim **1** in a physiologically acceptable medium.

4,256,736
PSYCHOPHARMACOLOGICAL PEPTIDES

David de Wied, Bilthoven, and Hendrik M. Greven, Heesch, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Feb. 22, 1979, Ser. No. 14,081
Claims priority, application Netherlands, Mar. 2, 1978, 7802289
Int. Cl.[3] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **35 Claims**

1. A compound of the formula:

$$A_1\text{-}A_2\text{-L-Phe-X-L-Thr-L-Ser-}R_1\text{-Y-L-Ser-}R_2\text{-L-Thr-L-Pro-L-Leu-L-Val-L-Thr-B} \quad \text{(I)}$$

wherein:

(a) A_1 and A_2 each represent an L-amino-acid residue of the formula H_2N-ALK-CO-, wherein ALK is an alkylidene group with 1 to 6 carbon atoms;

(b) X is an amino-acid residue selected from the group consisting of L-Met, L-Met(O), L-Met(O_2) and L-Leu;

(c) R_1 and R_2 each represent one of the amino-acid residues selected from the group consisting of L-Glu and L-Gln;

(d) Y represents an amino-acid residue selected from the group consisting of L-Lys and D-Lys; and

(e) B represents one of the amino-acid- or peptide-moieties selected from L-Leu-OH, D-Leu-OH, L-Leu-L-Phe-OH, L-Leu-L-Phe-L-Lys-OH, L-Leu-L-Phe-D-Lys-OH, L-leucinol and L-MeLeu and functional derivatives of said compound selected from the group consisting of pharmaceutically acceptable salts addition salts, pharmaceutically acceptable metal salts, aliphatic esters containing up to about eighteen carbon atoms, unsubstituted amides, amides substituted with alkyl group (s) containing up to about six carbon atoms, N-acyl derivatives wherein the aliphatic carboxylic acid group has from one to about six carbon atoms, and pharmaceutically acceptable metal complexes.

4,256,737
LONG ACTING DEPOT INJECTABLE FORMULATIONS FOR LH-RH ANALOGUES

John J. Nestor, San Jose, and Brian H. Vickery, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 11, 1979, Ser. No. 47,662
Int. Cl.[3] A61K *37/02, 37/24, 37/38*
U.S. Cl. 424—177 **1 Claim**

1. A pharmaceutical composition for release of an analogue of luetinizing hormone-releasing hormone or a pharmaceutically acceptable salt thereof over an extended period of time comprising between about 0.01 and 1.0 percent by weight of a pharmaceutically acceptable salt of said analogue, said salt selected from the group consisting of the zinc, zinc tannate and pamoate salts of

[D-Phe^6]LHRH, [D-Trp^6]LHRH, [D-Leu^6]LHRH, [D-Ala^6]LHRH, desGly^{10}-[D-Phe^6, ProNHEt^9]LHRH, desGly^{10}-[D-Trp^6, ProNHEt^9]LHRH, desGly^{10}-[D-Ala^6, ProNHEt^9]LHRH, desGly^{10}-[D-Leu^6, ProNHEt^9]LHRH, desGly^{10}-[D-Ser(t-Bu)^6, ProNHEt^9]LHRH and desGly^{10}-[D-Ser(t-Bu)^6, Aza-Gly-NH_2^{10}]LHRH

in admixture with a vehicle comprising (i) between about 1–3% by weight of aluminum monostearate and (ii) an oil of vegetable origin.

4,256,738

9-(ω-HETEROARYLAMINO-ALKYLAMINO)-ERYTHROMYCINS AND SALTS THEREOF

Eberhard Woitun; Bernd Wetzel; Roland Maier, all of Biberach an der Riss; Wolfgang Reuter, Laupertshausen; Uwe Lechner, Ummendorf; Rolf G. Werner, and Hanns Goeth, both of Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 957,451

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2750288

Int. Cl.[3] **A61K** *31/70;* **C07H** *17/09*

U.S. Cl. 424—180 **7 Claims**

1. A compound selected from the group consisting of N-[3-(2-dimethylamino-pyrimidin-4-yl-amino)-propyl]-erythromycylamine,

N-[3-(2-dimethylamino-5-methyl-pyrimidin-4-yl-amino-propyl]-erythromycylamine,

N-[3-(2-dimethylamino-5,6,7,8-tetrahydroquinazolin-4-yl-amino)-propyl]-erythromycylamine,

N-[3-(6-dimethylamino-pyrimidin-4-yl-amino)-propyl]-erythromycylamine,

and non-toxic, pharmacologically acceptable acid addition salts thereof.

6. An antibacterial pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antibacterial amount of a compound of claim 1.

7. The method of destroying or suppressing the growth or reproduction of bacteria in a warm-blooded animal, which comprises perorally or parenterally administering to said animal an effective antibacterial amount of a compound of claim 1.

4,256,739

7β-AMINO-3-THIO-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS, AND ANTIBACTERIAL COMPOSITIONS AND METHODS USING THEM

Robert B. Woodward, Cambridge, Mass., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

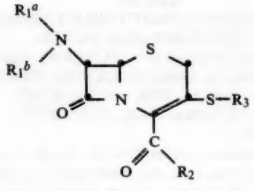
Filed Aug. 26, 1975, Ser. No. 607,983

Claims priority, application Switzerland, Aug. 30, 1974, 11836/74

Int. Cl.[3] **A61K** *31/545;* **C07D** *501/59*

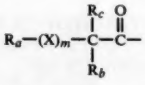
U.S. Cl. 424—200 **17 Claims**

1. A compound of the formula



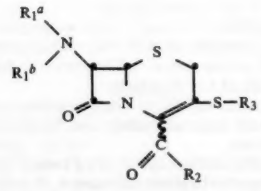
(IA)

wherein $R_1{}^a$ denotes hydrogen, cyanoacetyl, or an acyl group of the formula



(B),

wherein X denotes oxygen or sulfur and, if m represents zero or 1, R_a denotes phenyl, hydroxyphenyl, hydroxyphenyl protected by tert.-butoxycarbonyl or 2,2,2-trichloroethoxycarbonyl, hydroxy-chlorophenyl, hydroxy-chlorophenyl protected by tert.-butoxycarbonyl or 2,2,2-trichloroethoxycarbonyl, thienyl, 5-aminomethyl-2-thienyl, pyridyl, amino pyridinium, furyl, isothiazolyl, tetrazolyl, 1-cyclohexenyl, or 1,4-cyclohexadienyl, and R_b and R_c each represents hydrogen, or, if m represents zero, R_a denotes phenyl, hydroxyphenyl, hydroxyphenyl protected by tert.-butoxycarbonyl or 2,2,2-trichloroethoxycarbonyl, hydroxy-chlorophenyl, hydroxy-chlorophenyl protected by tert.-butoxycarbonyl or 2,2,2-trichloroethoxycarbonyl, thienyl, 5-aminoethyl-2-thienyl, pyridyl, aminopyridinium, furyl, isothiazolyl, tetrazolyl, 1-cyclohexenyl or 1,4-cyclohexadienyl, R_b denotes amino, tert.-butoxycarbonylamino, 2-halogeno-lower-alkoxycarbonylamino, lower alkoxyphenyl-lower alkoxycarbonylamino, phenyl-lower alkoxycarbonylamino, dihydroxy-triazinylcarbonylamino, 3-guanylureido, sulfoamino, tritylamino, 2-nitrophenylthioamino, 4-methylphenylsulfonylamino, 1-lower alkoxycarbonyl-2-propylideneamino, carboxyl, phenyl-lower alkoxycarbonyl, sulfo, hydroxyl, tert.-butoxycarbonyloxy, 2-halogen-lower alkoxycarbonyloxy, formyloxy, o-lower alkylphosphono, o,o'-di-lower alkylphosphono, 5-amino-5-carboxy-valeryl, 5-amino-5-carboxy-valeryl, wherein 5-amino is protected by lower alkanoyl, halogeno-lower alkanoyl, benzoyl or phthaloyl and 5-carboxy is protected by phenyl-lower alkoxycarbonyl, or 5-amino-5-carboxy-valeryl, wherein 5-carboxy is protected by phenyl-lower alkoxy and R_c denotes hydrogen, or, if m represents zero, R_a denotes phenyl, 2-thienyl, or 2-furyl and R_b and R_c conjointly denote lower alkoxyimino, cycloalkoxyimino or phenylalkoxyimino in the synconfiguration $R_1{}^b$ denotes hydrogen, R_2 represents hydroxyl, lower alkoxy, tert.-butoxy, 2-halogeno-lower alkoxy, diphenylmethoxy, lower alkoxy-diphenylmethoxy, or tri-lower alkylsilyloxy, and R_3 represents lower alkyl, amino lower alkyl, tert.-amino-lower alkyl, wherein the tert.-amino group is separated from the sulfur atom by at least two carbon atoms, etherified hydroxy-lower alkyl, wherein etherified hydroxy is lower alkoxy and separated from the sulfur atom by at least two carbon atoms, carbo-lower alkoxy-lower alkyl, or lower alkenyl or halogenmethyl, the 1-oxide of such 3-cephem compound of the formula IA, the corresponding 2-cephem compound of the formula IB,



(IB)

wherein $R_1{}^a$, $R_1{}^b$, R_2 and R_3 have the meanings indicated under formula IA, a 3-S-oxide thereof or a pharmaceutically acceptable salt of such compound.

14. A pharmaceutical preparation comprising an antibacterially effective amount of a compound of claim 1 and a pharmaceutically usable excipient.

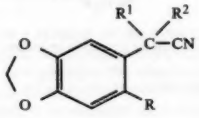
15. A method for the treatment of bacterial infections which comprises administering an antibacterially effective amount of a compound of claim 1.

4,256,740
SYNERGISTIC ARTHROPODICIDAL COMPOSITIONS CONTAINING α-SUBSTITUTED-3,4-METHYLENEDIOXY-PHENYLACETONITRILES

Volker Mues, Wuppertal; Wolfgang Behrenz, Overath; Klaus Ditgens, and Thomas Schmidt, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 851,571, Nov. 14, 1977, Pat. No. 4,182,771. This application May 9, 1979, Ser. No. 37,544
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654348; Jan. 15, 1977, 2701586
Int. Cl.[3] A01N *37/10, 43/30, 57/16, 57/28*
U.S. Cl. 424—200 18 Claims

1. An arthropidicidal composition containing as active compounds (i) a benzodioxole of the formula



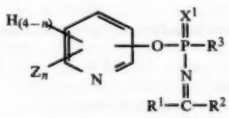
in which
R is hydrogen, alkyl or alkenyl with up to 6 carbon atoms, halogen or nitro,
R^1 is alkyl with 1 to 3 carbon atoms or hydrogen, and
R^2 is aryl-C_{1-3}-alkyl, alkyl or alkenyl with up to 6 carbon atoms, or cycloalkyl with 3 to 8 carbon atoms, or may represent hydrogen provided that R represents alkyl, alkenyl or nitro, or
R^1 and R^2 together are an alkylene radical with 2 to 8 carbon atoms, and
(ii) at least one arthropodicidal carboxylic acid ester or phosphoric acid ester, the weight ratio of component (i) to component (ii) ranging from about 0.1:10 to 10:0.1.

4,256,741
PYRIDYL ESTERS OF N-ALKYLIDENE-SUBSTITUTED PHOSPHOR- AND PHOSPHONAMIDIC ACIDS

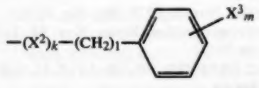
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 46,299, Jun. 7, 1979, Pat. No. 4,226,859. This application Apr. 14, 1980, Ser. No. 140,058
Int. Cl.[3] C07D *213/74;* A01N *57/16*
U.S. Cl. 424—200 10 Claims

1. A compound of the formula



wherein X^1 is selected from the group consisting of oxygen and sulfur; R^1 is selected from the group consisting of hydrogen, alkyl, phenyl lower alkoxy and lower alkylthio; R^2 is selected from the group consisting of, amino, lower alkylamino and di lower alkylamino; Z is selected from the group consisting of lower alkyl, lower alkoxy, nitro and halogen; and n is an integer from 0 to 4; and wherein R^3 is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio and



wherein X^2 is selected from the group consisting of oxygen and sulfur; X^3 is halogen; K is the integer 0 or 1; and l and m are each integers from 0 to 3.

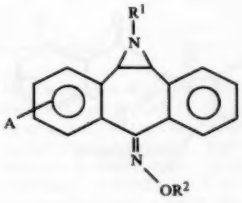
10. A method of controlling insects which comprises contacting said insects with an insecticidal composition comprising an inert carrier and, as an essential active ingredient, in an effective amount, a compound of claim 1.

4,256,742
ANTIDEPRESSANT OXIME ETHERS OF DIBENZOCYCLOHEPTAZIRIDONES

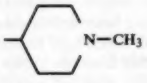
Michael J. Haire, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 937,716, Aug. 29, 1978, abandoned. This application Jun. 27, 1979, Ser. No. 51,341
Int. Cl.[3] C07D *203/26;* A61K *31/445, 31/395;* C07D *203/02*
U.S. Cl. 424—244 24 Claims

1. A compound of the formula



where
A is H, F, Cl, Br, NO_2, CF_3, C_{1-4}alkyl or C_{1-4}alkoxy;
R^1 is H, C_{1-4}alkyl, C_4-C_6 cycloalkylmethyl, C_{1-4}acyl or benzoyl;
R^2 is



or $-(CH_2)_nNXY$
wherein
n is 2 or 3,
X and Y independently are H or C_{1-4}alkyl or together are linked to form $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$; or
a pharmaceutically suitable acid addition salt thereof.

7. A compound of claim 1 where A is hydrogen, and
R^2 is $-(CH_2)_nNXY$ where
n is 2 and
X and Y independently are hydrogen or methyl.

4,256,743
INHIBITION OF BONE RESORPTION WITH H_1-BLOCKING ANTIHISTAMINES

Paul Goldhaber, Waban, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 14,070, Feb. 22, 1979, abandoned. This application Oct. 26, 1979, Ser. No. 88,397
Int. Cl.[3] A61K *31/44, 31/54, 31/13*
U.S. Cl. 424—247 13 Claims

1. A method for inhibiting bone resorption which comprises administering orally to a mammal suffering from osteoporosis or chronic destructive periodontal disease an H_1-blocking antihistamine selected from the group consisting of the H_1-blocking phenothiazines, the H_1-blocking ethylenediamines,

and the H_1-blocking indenes, the amount being from 25–50 mg/day in the case of said phenothiazines, 25–50 mg up to 4 times a day in the case of said ethylenediamines, 1–2 mg 1 to 3 times a day in the case of said indenes.

4,256,744

AGRICULTURAL AND HORTICULTURAL PESTICIDES

Shigeo Seki; Yashuharu Sekizawa, both of Tokyo; Fumio Kai; Yukio Suzuki, both of Fujisawa; Michiaki Iwata, and Tetsuro Watanabe, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

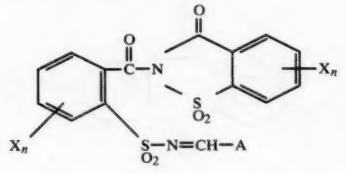
Filed Feb. 2, 1979, Ser. No. 9,028

Claims priority, application Japan, Feb. 14, 1978, 53-14964; Feb. 14, 1978, 53-14965

Int. Cl.[3] **C07D** *277/62*

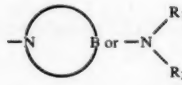
U.S. Cl. 424—248.51 **28 Claims**

2. A pesticidal composition comprising as an active ingredient a compound of the formula (I):



(I)

wherein A represents



in which B represents a ring-forming residue of a 5- or 6-membered carbon-containing heterocyclic ring containing at least one nitrogen atom and which may further contain an oxygen atom in the ring selected from the group consisting of a morpholine ring, a piperidine ring and a pyrrolidine ring, and R_1 and R_2 are the same or different and each represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, a phenyl group substituted with an alkyl or alkoxy group having 1 to 4 carbon atoms or a halogen atom, a benzyl group or a benzyl group substituted with an alkyl or alkoxy group having from 1 to 4 carbon atoms or a halogen atom; n represents 0 or an integer of 1 or 2 corresponding to the number of X substituents; and X represents a halogen atom, a nitro group, a carboxyl group or a carbamoyl group, and when two X substituents are present they may be the same or different, along with a carrier or diluent.

4,256,745

PROSTANE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Walter Elger; Olaf Loge, and Eckehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

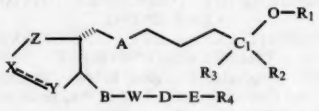
Continuation-in-part of Ser. No. 689,849, May 25, 1976, Pat. No. 4,105,792. This application Mar. 2, 1978, Ser. No. 882,687

Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523676; Apr. 12, 1976, 2616304

Int. Cl.[3] **C07C** *177/00, 69/02*

U.S. Cl. 424—248.55 **22 Claims**

1. A prostane derivative of the formula

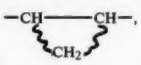


wherein

R_1 is the acyl radical of a physiologically acceptable organic monocarboxylic acid of 1–15 carbon atoms; R_2 and R_3 are each H or alkyl of 1–4 carbon atoms;

A is $—CH_2—CH_2—$, cis-CH=CH— or trans-CH=CH—;

B is $—CH_2—CH_2—$, trans-CH=CH, —C≡C— or



wherein the methylene group is in either the α- or β-position;

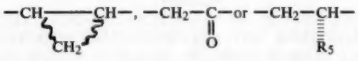
W is hydroxymethylene, or

wherein the OH-group is in either the α- or β- position;

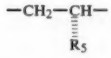
D and E together form a covalent bond, or D is a straight-chain or branched alkylene group of 1–5 carbon atoms or a —C≡C— group and E is oxygen, sulfur or a covalent bond;

R_4 is alkyl of 1–10 carbon atoms or cycloalkyl of 4–10 carbon atoms;

Z is carbonyl or hydroxymethylene; X=====Y is



wherein R_5 is lower alkyl or hydroxyl when Z is hydroxymethylene, and X =====Y is —CH=CH— or



wherein R_5 is lower alkyl or hydroxyl when Z is carbonyl.

4,256,746

DECHLOROMAYTANSINOIDS, THEIR PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Osamu Miyashita, Osaka, and Hiroshi Akimoto, Nishinomiya, both of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

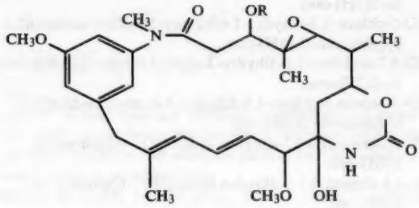
Filed Nov. 9, 1979, Ser. No. 92,954

Claims priority, application Japan, Nov. 14, 1978, 53-13995; Jun. 11, 1979, 54-73790

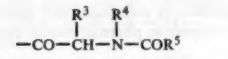
Int. Cl.[3] **C07D** *498/06;* **A61K** *31/535*

U.S. Cl. 424—248.54 **15 Claims**

1. A compound of the formula:



wherein R is H, acyl of the formula —COR^2 or acylaminoacyl of the formula



wherein R^2 is H or a member of the class consisting of C_{1-18} alkyl, C_{2-10} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkenyl, phenyl, naphthyl or a group of the class consisting of azetidinyl, pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3- or 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidyl, pyridazinyl, 2-imidazolinyl, imidazolidinyl, benzimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl, 1,4-benzodioxanyl, 1,2- or 1,3-dithiolanyl, 1,3-dithianyl, isoxazolyl, oxazolyl, morpholinyl, benzisoxazolyl, benzoxazolyl, isothiazolyl, thiazolyl, benzisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-, 1,2,5- or 1,3,4-oxadiazolyl, 1,2,3-, 1,2,4-, 1,2,5- or 1,3,4-thiadiazolyl, 1,2,3-, 1,2,5- or 1,3,4-triazolyl, 1,3,5-triazinyl, benzotriazolyl and 1,2,3,4-tetrazolyl,

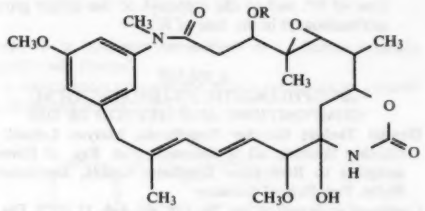
any of said R^2 groups being unsubstituted or substituted by C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4} alkylamino, C_{1-4} alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and

said cycloalkyl, cycloalkenyl, phenyl, naphthyl and heterocyclic groups being attached directly or through a C_{1-4} alkenylene group to the carbonyl group in the acyl radical R; wherein R^3 is H, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl, naphthyl, indolyl or imidazolyl, R^4 is H, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl or naphthyl, and R^5 is H, C_{1-18} alkyl, C_{2-10} alkenyl, C_{3-10} cycloalkyl, phenyl, naphthyl or a heterocyclic group of the class consisting of azetidinyl, pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihdyroquinolyl, 3- or 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidyl, pyridazinyl, 2-imidazolinyl, imidazolidinyl, benzimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl, 1,4-benzodioxanyl, 1,2- or 1,3-dithiolanyl, 1,3-dithianyl, isoxazolyl, oxazolyl, morpholinyl, benzisoxazolyl, benzoxazolyl, isothiazolyl, thiazolyl, benzisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-, 1,2,5- or 1,3,4-oxadiazolyl, 1,2,3-, 1,2,4-, 1,2,5- or 1,3,4-thiadiazolyl, 1,2,3-, 1,2,5- or 1,3,4-triazolyl, 1,3,5-triazinyl, benzotriazolyl and 1,2,3,4-tetrazolyl,

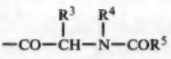
any of said groups in R^3, R^4 and R^5 being unsubstituted or substituted by C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4} alkylamino, C_{1-4} alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and

said cycloalkyl, cycloalkenyl, phenyl, naphthyl, indolyl, imidazolyl and heterocyclic groups when representing R^3, R^4 and R^5 being attached directly or through C_{1-4} alkylene, to the carbon between -CO- and N of acylaminoacyl in the case of R^3, to the nitrogen in acylaminoacyl in the case of R^4, and to the carbonyl of the amido group in acylaminoalcyl in the case of R^5.

15. A method for inhibiting the growth of tumor cells and prolonging the survival time of a tumor-bearing warm blooded animal, which comprises administering to said animal an effective amount of a compound of the formula:



wherein R is H, acyl of the formula —COR^2 or acylaminoacyl of the formula



wherein R^2 is H or a member of the class consisting of C_{1-18} alkyl, C_{2-10} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkenyl, phenyl, naphthyl or a group of the class consisting of azetidinyl, pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3- or 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolidinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidyl, pyridazinyl, 2-imidazolinyl, imidazolidinyl, benzimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl, 1,4-benzodioxanyl, 1,2- or 1,3-dithiolanyl, 1,3-dithianyl, isoxazolyl, oxazolyl, morpholinyl, benzisoxazolyl, benzoxazolyl, isothiazolyl, thiazolyl, benzisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-, 1,2,5- or 1,3,4-oxadiazolyl, 1,2,3-, 1,2,4-, 1,2,5- or 1,3,4-thiadiazolyl, 1,2,3-, 1,2,5- or 1,3,4-triazolyl, 1,3,5-triazinyl, benzotriazolyl and 1,2,3,4-tetrazolyl,

any of said R^2 groups being unsubstituted or substituted by C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4} alkylamino, C_{1-4} alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and

said cycloalkyl, cycloalkenyl, phenyl, naphthyl and heterocyclic groups being attached directly or through a C_{1-4} alkylene group to the carbonyl group in the acyl radical R; wherein R^3 is H, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl, naphthyl, indolyl or imidazolyl, R^4 is H, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl or naphthyl, and R^5 is H, C_{1-18} alkyl, C_{2-10} alkenyl, C_{3-10} cycloalkyl, phenyl, naphthyl or a heterocyclic group of the class consisting of azetidinyl, pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3- or 4-isoquinolyl, 1,2-dihyroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidyl, pyridazinyl, 2-imidazolinyl, imidazolidinyl, benzimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl, 1,4-benzodioxanyl, 1,2- or 1,3-dithiolanyl, 1,3-dithianyl, isoxazolyl, oxazolyl, morpholinyl, benzisoxazolyl, benzoxazolyl, isothiazolyl, thiazolyl, benzisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-, 1,2,5- or 1,3,4-oxadiazolyl, 1,2,3-, 1,2,4-, 1,2,5- or 1,3,4-thiadiazolyl, 1,2,3-, 1,2,5- or 1,3,4-triazolyl, 1,3,5-triazinyl, benzotriazolyl and 1,2,3,4-tetrazolyl,

any of said groups in R^3, R^4 and R^5 being unsubstituted or substituted by C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4} alkylamino, C_{1-4} alkylthio, me-

thylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and

said cycloalkyl, cycloalkenyl, phenyl, naphthyl, indolyl, imidazolyl and heterocyclic groups when representing R^3, R^4 and R^5 being attached directly or throuch C_{1-4} alkylene, to the carbon between -CO- and N of acylaminoacyl in the case of R^3, to the nitrogen in acylaminoacyl in the case of R^4, and to the carbonyl of the amido group in acylaminoacyl in the case of R^5.

4,256,747

ANTIPHLOGISTIC PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Oswald Tauber; Günther Engelhardt; Matyas Leitold, and Günther Schmidt, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 878,904, Feb. 17, 1978, Pat. No. 4,154,833. This application Mar. 30, 1979, Ser. No. 25,718

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708520

Int. Cl.³ A61K *31/045, 31/495*

U.S. Cl. 424—250 **2 Claims**

1. The method of suppressing the undesirable gastro-intestinal side-effects produced by administering 4-(4-biphenylyl)-butanol to a warm-blooded animal in need thereof, which comprises simultaneously administering to said animal 1 part by weight of 5,11-dihydro-11-[(4-methyl-1-piperazinyl)-acetyl]-6H-pyrido[2,3-b][1,4]-benzodiazepin-6-one per 2 to 500 parts by weight of 4-(4-biphenylyl)-butanol.

4,256,748

IMIDAZO[2,1-B]QUINAZOLIN-2(3H)-ONES AND PHARMACEUTICAL COMPOSITIONS FOR TREATMENT AND PROPHYLAXIS OF CARDIAC INSUFFICIENCY AND CARDIAC FAILURE

Madhukar S. Chodnekar, Seltisberg, and Ado Kaiser, Lausen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 924,117, Jul. 13, 1978, abandoned. This application Jun. 20, 1979, Ser. No. 50,395

Claims priority, application Luxembourg, Jul. 25, 1977, 77829; Switzerland, May 26, 1978, 5776/78

Int. Cl.³ A61K *31/505;* C07D *487/04*

U.S. Cl. 424—251 **11 Claims**

1. A compound of the group consisting of

D-6-chloro-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-7-bromo-1,5-dihydro-3,6-dimethyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-6-chloro-1,5-dihydro-7-methoxy-3-methyl-imidazo[2,1-b]quinazolin-2-(3H)-one;

D-6,7-dichloro-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-7-bromo-6-chloro-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-3,6-dimethyl-1,5-dihydro-imidazo[2,1-b]quinazolin-2-(3H)-one;

L-3,6-dimethyl-1,5-dihydro-imidazo[2,1-b]quinazolin-2(3H)-one;

L-3,9-dimethyl-1,5-dihydro-imidazo[2,1-b]quinazolin-2(3H)-one;

D-7-bromo-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazoline-2(3H)-one,

their tautomers and pharmaceutically acceptable acid addition salts.

11. A pharmaceutical composition for the treatment and prophylaxis of cardiac insufficiency and cardiac failure containing an effective amount for such treatment and prophylaxis of a compound of the group consisting of

D-6-chloro-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-7-bromo-1,5-dihydro-3,6-dimethyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-6-chloro-1,5-dihydro-7-methoxy-3-methyl-imidazo[2,1-b]quinazolin-2-(3H)-one;

D-6,7-dichloro-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-7-bromo-6-chloro-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazolin-2(3H)-one;

D-3,6-dimethyl-1,5-dihydro-imidazo[2,1-b]quinazolin-2(3H)-one;

L-3,6-dimethyl-1,5-dihydro-imidazo[2,1-b]quinazolin-2(3H)-one;

L-3,9-dimethyl-1,5-dihydro-imidazo[2,1-b]quinazolin-2(3H)-one;

D-7-bromo-1,5-dihydro-3-methyl-imidazo[2,1-b]quinazoline-2(3H)-one,

their tautomers and pharmaceutically acceptable acid addition salts in association with a compatible pharmaceutical carrier material.

4,256,749

FLUORINE-CONTAINING 1,4-DIHYDROPYRIDINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS THEREOF AND THEIR MEDICINAL USE

Harald Horstmann; Friedrich Bossert; Arend Heise, and Stanislav Kazda, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

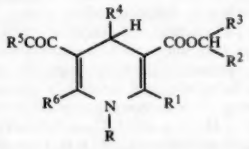
Filed Sep. 10, 1979, Ser. No. 74,048

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1978, 2841667

Int. Cl.³ A61K *31/44;* C07D *213/55*

U.S. Cl. 424—251 **19 Claims**

1. A fluorine-containing 1,4-dihydropyridine of the formula



(I)

or a salt thereof, in which

R denotes a hydrogen atom an alkyl group having up to 8 carbon atoms or an aralkyl group which is monocyclic or bicyclic carbocyclic in the aryl portion and contains up to 8 carbon atoms in the alkyl portion,

R^1 and R^6 identical or different and each denotes an alkyl group having up to 8 carbon atoms,

R^4 represents alkyl having up to 8 carbon atoms or represents a monocyclic or bicyclic carbocyclic aryl radical which is optionally substituted by 1 or 2 identical or different substituents selected from nitro, cyano, trifluoromethyl, halogen, azido, trifluoromethoxy, alkyl, alkoxy, alkylmercapto and SO_2—alkyl, each of said alkyl, alkoxy, alkylmercapto and SO_2—alkyl groups having up to 8 carbon atoms, or denotes a quinolyl, pyridyl, pyrimidyl, thienyl or furyl radical which is optionally substituted by alkyl having up to 8 carbon atoms or halogen,

R^5 denotes an alkyl group having up to 8 carbon atoms which is optionally substituted by halogen, or denotes an alkenyl, alkynyl, alkoxyalkyl or aminoalkyl group, each having up to 8 carbon atoms, it being possible for the two hydrogen atoms of the amino group to be replaced by 1 or 2 alkyl groups each having up to 8 carbon atoms and/or by an aralkyl group as defined above for R,

or denotes a radical of the formula

and

R^2 and R^3 in each case are identical or different and either one of the two substituents denotes a hydrogen atom and the other substituent denotes, or each of the two substituents denotes, a straight-chain,

branched or cyclic radical group having up to 8 carbon atoms or an aralkyl group which is monocyclic or bicyclic carbocyclic in the aryl portion and contains up to 8 carbon atoms in the alkyl portion which contains at least 1 perfluorinated carbon atom having 2 or 3 fluorine substituents, this alkyl radical optionally being interrupted by the group $-CH_2-X-CH_2-$,

in which

X denotes oxygen or sulphur,

or in which

R^2 and R^3 together with the CH group complete a saturated isocyclic ring which has 4 to 7 ring members and contains at least 1 perfluorinated carbon atom and is optionally substituted by an alkyl group, it being possible for this alkyl group, in turn, again to contain 1 or 2 perfluorinated carbon atoms.

in which

X denotes oxygen or sulphur,

or in which

R^2 and R^3 together with the CH group completes a saturated isocyclic radical which has 4 to 7 ring members and contains 1, 2 or 3 perfluorinated carbon atoms and is optionally substituted by an alkyl group with 1 to 4 carbon atoms, it being possible for this alkyl group, in turn, again to contain one or two perfluorinated carbon atoms.

10. A method of combating circulatory diseases in warm-blooded animals which comprises administering to the animals a circulation influencing amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,256,750

PHARMACEUTICAL COMPOSITIONS

Joachim E. Göring, and Peter P. Ochlich, both of Gronau, Fed. Rep. of Germany, assignors to Johann A. Wulfing, Fed. Rep. of Germany

Division of Ser. No. 38,564, May 14, 1979. This application Dec. 11, 1979, Ser. No. 102,394

Int. Cl.[3] **A61K** *31/52*

U.S. Cl. 424—253 **33 Claims**

1. A pharmaceutical composition useful for the treatment of peripheral vascular disease in humans and animals in unit dosage form wherein each dosage unit comprises from 1 to 30 mg of 1,3-di-n-butyl-7-(2-oxoproyl)xanthine in combination with a pharmaceutically acceptable carrier therefor.

4,256,751

TETRAHYDROISOQUINOLINE DERIVATIVES

Kimiaki Hayashi, Suita; Jyoji Kato, Yawata; Tomofumi Uchida, Neyagawa, and Naoto Yoneda, both of Suita, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

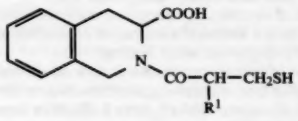
Filed Nov. 8, 1979, Ser. No. 92,475

Claims priority, application Japan, Nov. 27, 1978, 53/14695

Int. Cl.[3] **C07D** *217/16;* **A61K** *31/47*

U.S. Cl. 424—258 **4 Claims**

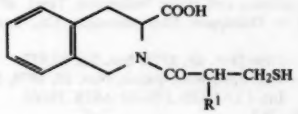
1. A compound of the formula:



(I)

wherein R^1 is hydrogen or methyl, or a pharmaceutically acceptable salt thereof.

4. A hypotensive composition which comprises an amount of a compound of the formula:



wherein R^1 is hydrogen or methyl, or a pharmaceutically acceptable salt thereof, and which amount is sufficient, when administered to a warm blooded animal, to provide an effective amount thereof in said animal, and a pharmaceutically acceptable carrier therefor.

4,256,752

TREATMENT OF ULCERS WITH ACYLATED AMINOALKYL CYANOGUANIDINES CONTAINING A HETEROCYCLIC RESIDUE

Walter von Bebenburg, Dreieich; Norbert Schulmeyer, Mörfelden-Walldorf, and Istvan Szelenyi, Büttelborn, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

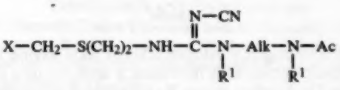
Filed Feb. 13, 1979, Ser. No. 11,927

Claims priority, application United Kingdom, Feb. 17, 1978, 6367/78

Int. Cl.[2] **A61K** *31/44, 31/415;* **C07D** *213/58, 233/64*

U.S. Cl. 424—263 **15 Claims**

1. A compound corresponding to the formula:



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in which X is a imidazolyl, imidazolyl substituted by 1 to 2 C_1–C_4-alkyl groups, pyridyl or pyridyl substituted in the 3 or 4 position by hydroxy atoms, each R^1 represents hydrogen or a C_1–C_4-alkyl group, Alk represents a C_2–C_6-alkylene chain and Ac represents a C_2–C_8-alkanoyl radical or a benzoyl radical substituted once, twice or three times by halogen atoms, nitrile groups, nitro groups, carboxy groups, carbamoyl groups, C_2–C_5-alkylcarbonyl groups, C_2–C_5-carbalkoxy groups, sulphamoyl groups, C_1–C_4-alkylsulphinyl groups or C_1–C_4-alkylsulphonyl groups, or in which Ac is a cyano group, a formyl group, a C_2–C_6-alkencarbonyl group, a C_2–C_6-alkincarbonyl group or such alkenecarbonyl group or alkincarbonyl group substituted by a C_2–C_6 carbalkoxy group, a C_3–C_6-cycloalkancarbonyl group or such a group substituted by halogen and/or a C_1–C_6-alkyl group, or in which Ac is a C_1–C_6-alkylsulphonyl radical or a phenyl sulphonyl radical in which the alkyl or phenyl moiety may be substituted once, twice or three times by halogen atoms, nitrile groups, nitro groups, carboxy groups, carbamoyl groups, C_2–C_5-alkylcarbonyl groups, C_2–C_5-carbalkoxy groups, C_1–C_4-alkylsulphinyl groups, C_1–C_4-alkylsulphonyl groups, sulphamoyl groups, hydroxy groups, mercapto groups, C_1–C_4-alkoxy groups,

C_1–C_4-alkyl mercapto groups or C_1–C_4-alkyl groups or a salt thereof with a pharmaceutically acceptable acid.

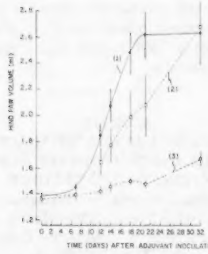
9. A method of combatting ulcers in a mammal comprising administering to the mammal an amount of a compound of claim **1** effective to provide ulcer healing.

11. A method of providing a mammal with an antihistamine or the H_2-Blocker type comprising administering to the mammal an amount of a compound of claim **1** effective to provide said antihistamine action.

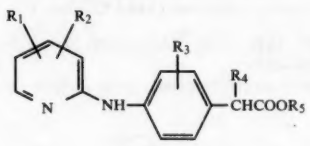
4,256,753
4-(2-PYRIDYLAMINO)PHENYLACETIC ACID DERIVATIVES

Hitoshi Uno, Takatsuki; Yasutaka Nagai, Muko; Katsuhiko Hino, Izumisano, and Hideo Nakamura, Tenri, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 19, 1979, Ser. No. 95,572
Claims priority, application Japan, Nov. 27, 1978, 53/146952
Int. Cl.³ C07D *213/74;* **A61K** *31/44*
U.S. Cl. 424—263 **9 Claims**

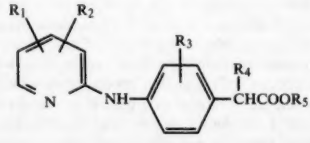


1. A compound of the formula:



wherein R_1 is hydrogen, a halogen, a lower alkyl having 1 to 3 carbon atoms, or nitro, R_2 is hydrogen, a halogen, or a lower alkyl having 1 to 3 carbon atoms, R_3 is hydrogen, a halogen, or a lower alkyl having 1 to 3 carbon atoms, R_4 is hydrogen or a lower alkyl having 1 to 3 carbon atoms, R_5 is hydrogen or $—CH_2CH_2OR_6$ wherein R_6 is a lower alkyl having 2 or 3 carbon atoms and being substituted with 1 or 2 hydroxy groups, provided that R_1 or R_2 is not 4-halogen, or a pharmaceutically acceptable salt thereof.

7. An anti-inflammatory and analgesic pharmaceutical composition for the treatment of body tissues of mammals and humans comprising an effective amount of a compound of the formula:



wherein R_1 is hydrogen, a halogen, a lower alkyl having 1 to 3 carbon atoms, or nitro, R_2 is hydrogen, a halogen, or a lower alkyl having 1 to 3 carbon atoms, R_3 is hydrogen, a halogen, or a lower alkyl having 1 to 3 carbon atoms, R_4 is hydrogen or a lower alkyl having 1 to 3 carbon atoms, R_5 is hydrogen or $—CH_2CH_2OR_6$ wherein R_6 is a lower alkyl having 2 or 3 carbon atoms and being substituted with 1 or 2 hydroxy groups, provided that R_1 or R_2 is not 4-halogen, or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

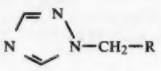
9. The method of treating mammals and humans with the pharmaceutical composition of claim **7**.

4,256,754
INSECTICIDAL AGENTS

Friedrich Linhart, Heidelberg; Bernd Zeeh, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

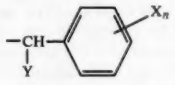
Filed Jul. 20, 1979, Ser. No. 59,186
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833193
Int. Cl.³ A01N *47/10, 47/12*
U.S. Cl. 424—269 **8 Claims**

1. An insecticidal agent containing an insecticidally effective amount of a mixture of a triazole derivative of the formula



I,

wherein R denotes unsubstituted or halogen-substituted phenyl, or



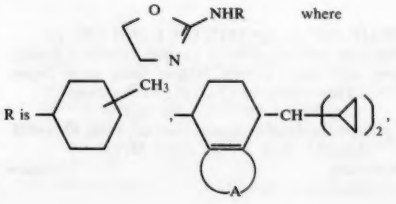
Y denoting hydrogen, halogen, alkylmercapto of 1 to 6 carbon atoms, alkenylmercapto of 2 to 6 carbon atoms, or unsubstituted or halogen-substituted phenylmercapto, X denoting halogen, and n denoting one of the integers zero, 1 and 2, with the proviso that n does not denote zero when Y is halogen, or a salt of a triazole derivative of formula I, and an insecticidal active ingredient selected from the group consisting of one or more carbamates, the ratio of the triazole derivative of formula I, or a salt of said triazole, to the insecticidally active ingredient is from 1:10 to 10:1 parts by weight.

4,256,755
METHOD OF USING N-SUBSTITUTED DIHYDRO-2-OXAZOLAMINES AS ANALGESICS

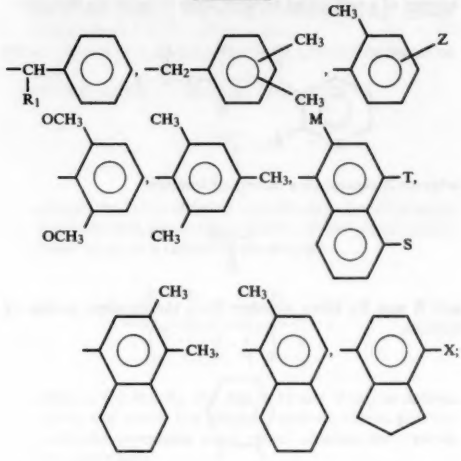
Dewey H. Smith, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 28, 1980, Ser. No. 144,543
Int. Cl.³ A61K *31/42*
U.S. Cl. 424—272 **5 Claims**

1. A method of alleviating pain in a mammal comprising administering to a mammal having pain an effective analgesic amount of a compound of the formula



-continued



where

A is —CH=CH—CH=CH— or —S—CH=CH—;

R_1 is CH_3 or

Z is H, CH_3, OCH_3 or Cl;

S and T are both H or may be taken together to be —CH_2CH_2—; and

M and X are independently H or CH_3; and pharmaceutically suitable acid addition salts thereof.

4,256,756

1-ARYLOXY-2-HYDROXY-3-[(SUBSTITUTED PHENYL-DONIDAZALIDINON-2-YL)-ALKYL-AMINO]-PROPANES AND SALTS THEREOF

Herbert Köppe, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth; Kurt Schromm, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Gojko Muacevic, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

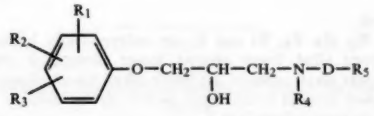
Continuation-in-part of Ser. No. 838,450, Oct. 3, 1977, abandoned. This application Jan. 17, 1979, Ser. No. 4,279

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644833

Int. Cl.[2] **A61K** *31/415;* **C07D** *233/36*

U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula



wherein

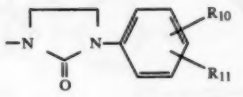
R_1 is hydrogen; halogen; trifluoromethyl; nitro; alkyl of 1 to 8 carbon atoms; alkoxy of 1 to 4 carbon atoms; alkoxyalkyl of 2 to 8 carbon atoms; alkenyl of 2 to 5 carbon atoms; alkynyl of 2 to 5 carbon atoms; alkenyloxy of 3 to 6 carbon atoms; alkynyloxy of 3 to 6 carbon atoms; $-(CH_2)_x-A'$, where x is 1, 2 or 3 and A' is cyano, amino, carboxamido or hydroxyl; phenoxy, naphthoxy, benzyloxy or —$CH_2SO_2CH_3$;

R_2 is hydrogen; halogen; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; aralkoxy of 7 to 14 carbon atoms; alkenyl of 2 to 4 carbon atoms; nitro; or, together with R_3, —CH=CH—CH=CH— which is attached to carbon atoms of the phenyl ring in the o-position with respect to each other;

R_3 is hydrogen; halogen; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; or aralkoxy of 7 to 14 carbon atoms;

R_4 is hydrogen; alkyl of 1 to 5 carbon atoms; or aralkyl of 7 to 14 carbon atoms;

R_5 is



where R_{10} and R_{11} are each hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, carboxamido or, together with each other, —O—$(CH_2)_y$—O—, where y is 1 or 2, attached to carbon atoms of the phenyl ring in o-position with respect to each other; and

D is alkylene of 1 to 12 carbon atoms, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,256,757

1-SUBSTITUTED IMIDAZOLES FOR INHIBITION OF THROMBOXANE SYNTHETASE

Masaki Hayashi; Tadao Tanouchi, both of Takatsuki; Masanori Kawamura, Ibaraki, and Ikuo Kajiwara, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd. and Kissei Pharmaceutical Co., Ltd.

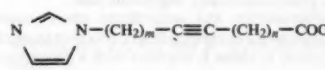
Filed May 2, 1979, Ser. No. 35,181

Claims priority, application Japan, May 2, 1978, 53-52266

Int. Cl.[3] **A61K** *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 R **16 Claims**

1. An imidazole derivative of the formula:



IB

wherein R^1 represents a hydrogen atom, a non-toxic cation, or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, and m and n, which may be the same or different, each represent zero, or an integer of 1 to 10, or a non-toxic acid addition salt thereof.

16. A pharmaceutical composition for the treatment of inflammation, hypertension, thrombus, cerebral apoplexy, or asthma, which comprises, as active ingredient, an effective amount of at least one imidazole derivative as claimed in claim **1**, or a non-toxic acid addition salt thereof, in association with a pharmaceutical carrier or coating.

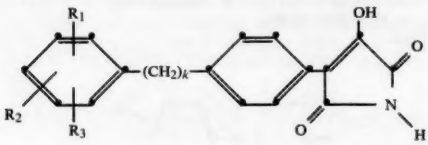
4,256,758

4-SUBSTITUTED-3-HYDROXY-3-PYRROLINE-2,5-DIONE INHIBITORS OF GLYCOLIC ACID OXIDASE

Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 11, 1979, Ser. No. 47,413
Int. Cl.³ C07D *207/40, 207/416;* **A61K** *31/40*
U.S. Cl. 424—274 **6 Claims**

1. The compounds having the structure:



wherein:

k is 0 to 3;

R_1, R_2 and R_3 are independently hydrogen, halogen, loweralkyl containing 1 to 6 carbon atoms, loweralkoxy containing 1 to 6 carbon atoms.

6. A method of treating persons afflicted with calcium oxalate kidney or bladder stones, or preventing the formation of kidney or bladder stones, which comprises administering to such a patient an effective amount of 4-(4′-bromo-4-biphenylyl)-3-hydroxy-3-pyrroline-2,5-dione.

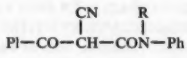
4,256,759

ALPHACARBAMOYL-PYRROLPROPIONITRILES

Gordon N. Walker, Morristown, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 46,063, Jun. 11, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,489
Int. Cl.³ C07D *207/337;* **A61K** *31/40*
U.S. Cl. 424—274 **9 Claims**

1. A 1-substituted-β-oxo-α-phenylcarbamoyl-pyrrolpropiontrile of the formula



wherein Pl is 2- or 3-pyrrolyl substituted in 1-position by lower alkyl or Ph-lower alkyl and being unsubstituted in the remaining 3 positions, or substituted therein by lower alkyl and/or one carboxy or lower carbalkoxy; Ph is phenyl, unsubstituted or substituted by one to three identical or different members selected from lower alkyl, lower alkoxy, lower alkylthio, hydroxy, halogeno, trifluoromethyl, nitro, amino or lower alkanoylamino; and R is hydrogen or lower alkyl; a lower alkylenol ether or lower alkanoylenol ester, or a salt thereof derived from a pharmaceutically acceptable base.

8. An antiinflammatory and antiarthritic pharmaceutical composition comprising a correspondingly effective amount of a compound claimed in claim 1, together with a pharmaceutical excipient.

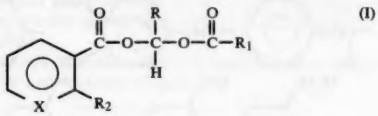
4,256,760

METHODS OF TREATING MAMMALS SUFFERING FROM INFLAMMATION AND PAIN

Mario A. Los, Capital Federal, Argentina, assignor to Laboratorios Bago S.A., Capital Federal, Argentina

Continuation-in-part of Ser. No. 2,225, Jan. 9, 1979, abandoned. This application Jun. 4, 1979, Ser. No. 44,944
Int. Cl.³ A61K *31/335, 31/625;* **C07D** *307/83, 307/87*
U.S. Cl. 424—279 **6 Claims**

1. A method of alleviating pain and inflammation in mammals, including humans, suffering from pain and inflammation, which comprises; administering to the mammal an effective amount of a compound selected from those of the formula:

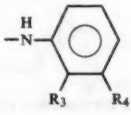


(I)

wherein X represents a moiety of formula:

and R and R_1 taken together form the divalent moiety of formula:

and R_2 is selected from an acetoxy group and a group of the formula:



wherein R_3 is selected from the group consisting of hydrogen and methyl, R_4 is selected from the group consisting of methyl and trifluoromethyl; and the pharmaceutically acceptable acid addition salts thereof.

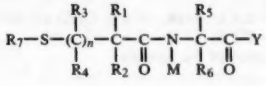
4,256,761

ANTIHYPERTENSIVE AMIDES

John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y.; Bruce E. Williams, Yorktown Heights, N.Y., and Alfred Schwab, Williston Park, N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Jul. 13, 1979, Ser. No. 57,175
Int. Cl.³ A61K *31/36, 31/265;* **C07C** *149/43, 149/40*
U.S. Cl. 424—282 **18 Claims**

1. Compounds of the structure



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 are independently hydrogen, lower alkyl, lower alkenyl, lower alkenyl, or phenyl-lower alkyl, wherein the lower alkyl, lower alkenyl and lower alkynyl groups have up to 6 carbon atoms,

n is an integer from 0 to 4,

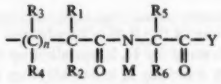
M is lower alkenyl, lower alkynyl, cycloalkyl, cycloalkyl-lower alkyl, bicycloalkyl, fused arylcycloalkyl, phenyl, lower alkylphenyl, phenyl-lower alkyl, hydroxyphenyl, methylenedioxyphenyl, bicycloalkyl-lower alkyl, lower alkylthio-lower alkyl, lower alkoxy-lower alkyl, halophenyl or, lower alkylthiophenyl, wherein the lower alkyl, lower alkenyl and lower alkynyl groups contain up

to 6 carbon atoms and the cycloalkyl, cycloalkyl lower alkyl, bicycloalkyl, and fused aryl-cycloalkylkyl groups contain from 3 to 16 carbon atoms,

Y is hydroxy, lower alkoxy having 1 to 6 carbon atoms or amino,

R_7 is hydrogen, lower alkanoyl, benzoyl, ZS or

wherein the lower alkanoyl contains up to 6 carbon atoms Z is hydrogen, lower alkyl, hydroxy-lower alkyl, amino-lower alkyl, or a radical of the formula



wherein R_1, R_2, R_3, R_4, R_6, n, M and Y are as defined above, and where Y is hydroxy, their non-toxic, pharmaceutically acceptable alkali metal, alkaline earth metal, and amine salts.

4,256,762

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John P. Clayton, Horsham, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, United Kingdom

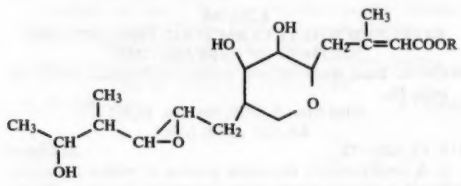
Division of Ser. No. 931,385, Aug. 7, 1978, which is a division of Ser. No. 843,394, Jan. 30, 1978, which is a division of Ser. No. 803,466, Jun. 6, 1977, Pat. No. 4,102,901. This application May 21, 1979, Ser. No. 40,740

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.[3] A61K *31/35*

U.S. Cl. 424—283 **10 Claims**

6. A method of treating a bacterial infection in a human or other animal which comprises administering to said human or other animal in need of said treatment an antibacterially effective amount of a compound of the formula:



wherein R is furylmethyl, tetrahydrofurylmethyl, or 2,3-epoxypropyl.

4,256,763

TREATMENT OF HERPES SIMPLEX INFECTIONS AND ACNE

John E. McHugh, 4322 Hayvenhurst Ave., Encino, Calif. 91436

Filed Sep. 19, 1978, Ser. No. 943,811

Int. Cl.[3] A61K *31/34*

U.S. Cl. 424—285 **11 Claims**

1. The method of treating Herpes Simplex viral infections and acne in humans comprising the administration of an effective dosage of 3,3-Bis(p-hydroxyphenyl)phthalide to a person afflicted with at least one of said conditions.

4,256,764

PROCESS FOR MAKING DERIVATIVES OF DIMERS OF ISOEUGENOL

Herfried Griengl, and Gabriele Foidl, both of Graz, Austria, assignors to PLC Pharmaceutical Licenses Co. Ltd., Switzerland

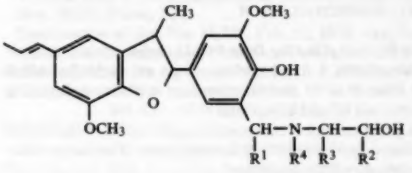
Filed Oct. 1, 1979, Ser. No. 80,552

Claims priority, application Austria, Nov. 15, 1978, 8151/78

Int. Cl.[3] A61K *31/34*; **C07D** *307/86*

U.S. Cl. 424—285 **7 Claims**

1. A process for manufacturing a compound of the formula



(IV)

wherein

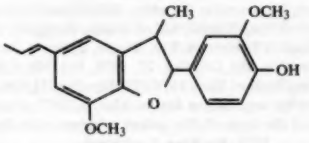
R^1 is selected from the group consisting of hydrogen, an unbranched or branched C_1–C_4 alkyl, halogen-substituted phenyl, and phenyl;

R^2 is hydrogen or phenyl;

R^3 is hydrogen or methyl; and

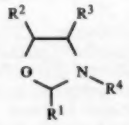
R^4 is selected from the group consisting of an unbranched or branched C_1–C_4 alkyl, an hydroxy-substituted unbranched or branched C_1–C_4 alkyl, allyl, and benzyl,

comprising reacting a dimer of isoeugenol of the formula



(I)

with an oxazoidine of the formula



(III)

wherein R^1, R^2, R^3, and R^4 have the same meaning as above.

7. A pharmaceutical composition for protection against liver damage comprising a liver-damage protecting effective amount of a compound selected from the group consisting of N-(5-trans-2,3-dihydro-7-methoxy-3-methyl-5-(E)-propenyl-benzofuran-2-yl)-2-hydroxy-3-methoxy phenylmethyl)-N-(2-hydroxyethyl)-N-benzylamine, N-(5-trans-2,3-dihydro-7-methoxy-3-methyl-5-(E)-propenyl-benzofuran-2-yl)-2-hydroxy-3-methoxyphenylmethyl)-N-(1-hydroxy-1-phenyl-2-propyl)-N-methylamine, N-(5-trans-2,3-dihydro-7-methoxy-3-methyl-5-(E)-propenyl-benzofuran-2-yl)-2-hydroxy-3-methoxyphenylmethyl)-N-(2-hydroxyethyl)-N-allylamine, and a therapeutically usable salt thereof, and

a pharmaceutically acceptable carrier.

4,256,765

NOVEL HYDROXAMIC ACID COMPOUNDS, METHOD FOR PREPARATION THEREOF AND MEDICAMENTS CONTAINING SUCH COMPOUNDS

Keiichi Munakata, Yono; Satoru Tanaka, Higashi-Kurume; Tamotsu Kanazawa, Tokorozawa; Masaru Satoh, Sayama; Jun-ichi Hase, and Kyoichi Kobashi, both of Toyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,733
Claims priority, application Japan, Sep. 18, 1978, 53-113636
Int. Cl.[3] C07C *83/10*; A61K *31/185*
U.S. Cl. 424—315 15 Claims

1. A hydroxamic acid compound represented by the formula:

$$R_1—CONHCH_2CONHOH$$

wherein R_1 is alkyl having from 4 to 11 carbon atoms, cycloalkyl having from 4 to 11 carbon atoms or cycloalkyl alkyl having from 4 to 11 carbon atoms, or a pharmacologically acceptable salt of said compound.

12. A pharmaceutical composition useful for the treatment of urolithiasis or pyelonephritis due to infection of urease-producing bacterium, which comprises

as an active ingredient, a hydroxamic acid compound represented by the formula:

$$R_1—CONHCH_2CONHOH$$

wherein R_1 is alkyl having from 4 to 11 carbon atoms, cycloalkyl having from 4 to 11 carbon atoms or cycloalkyl alkyl having from 4 to 11 carbon atoms, or a pharmacologically acceptable salt of said compound, and

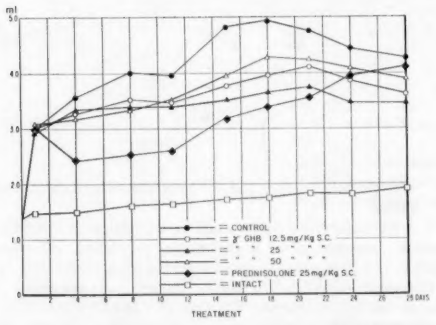
a pharmaceutically acceptable carrier therefor.

4,256,766

IMMUNOSUPPRESSANT

Takenori Mori, Takarazuka; Haruhisa Shirahama, Sapporo, and Tadashi Kurokawa, Sendai, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd, Tokyo, Japan

Division of Ser. No. 881,238, Feb. 27, 1978, Pat. No. 4,180,588. This application Mar. 19, 1979, Ser. No. 21,828
Claims priority, application Japan, Mar. 9, 1977, 52-25698
The portion of the term of this patent subsequent to Dec. 25, 1995, has been disclaimed.
Int. Cl.[3] A61K *31/195*
U.S. Cl. 424—319 4 Claims



1. A liquid pharmaceutical composition in dosage unit form which comprises an immunosuppressively effective amount of N-(p-hydroxyphenyl)-L-glutamine or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable sterile liquid carrier therefor in a form whereby said pharmaceutical composition is suitable for administration to a patient.

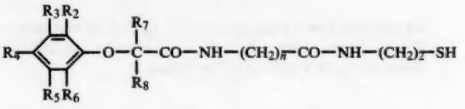
4,256,767

PHENOXY ALKYLAMIDES

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Jun. 19, 1979, Ser. No. 50,106
Claims priority, application Australia, Jun. 22, 1978, PD4821
Int. Cl.[3] A61K *31/18, 31/165*; C07C *143/72, 103/19*
U.S. Cl. 424—324 2 Claims

1. New phenoxy alkylamide derivatives of the formula:



wherein at least one of the R is not hydrogen, with:

R_3 and R_5 each stand for H, lower alkyl up to C_5 or t-butyl,

R_2 and R_6 each stand for H lower alkyl up to C_5

R_4 stands for H or halogen,

R_7 and R_8 each stand for H, or lower alkyl up to C_5, and n is an integer from 2 to 5 included.

2. A therapeutic composition of matter acting as an immunostimulating agent containing as active ingredient, an effective amount of a compound as defined in claim 1.

4,256,768

TREATMENT WITH DIALDEHYDES

Harry H. LeVeen, 800 Poly Pl., Brooklyn, N.Y. 11209

Continuation of Ser. No. 863,443, Dec. 22, 1977, abandoned, which is a continuation of Ser. No. 680,714, Apr. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 678,955, Apr. 21, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,028
Int. Cl.[3] A61K *31/11*
U.S. Cl. 424—333 7 Claims

1. A method of treating wet gangreneous tissue in a living animal which comprises applying to the surface thereof a lower aliphatic dialdehyde selected from the group consisting of glyoxal, glutaraldehyde, adipaldehyde, succinaldehyde, and suberaldehyde diluted from 0.1% up to about 10% by weight in a pharmaceutically acceptable carrier until said wet gangreneous tissue is converted to dry gangreneous tissue.

4,256,769

EXTRUDED WHEAT GERM FOOD PRODUCT AND METHOD OF PREPARATION

Wayne K. Rice, Wanatah, Ind., assignor to Vitamins, Inc., Chicago, Ill.

Filed Mar. 5, 1979, Ser. No. 17,461
Int. Cl.[3] A23B *1/04*
U.S. Cl. 426—72 22 Claims

1. A food product, the major portion of which comprises defatted, extruded wheat germ containing less than 5% by weight of oil, said product having an expanded open-cell structure, a crunchy and crisp texture and a palatable light, and mildly nut-like flavor (in its unflavored form), said product being stable in the presence of air at room temperature.

14. A method of preparing a food product which comprises:

defatting wheat germ to an oil content of less than 5%,

conditioning said defatted wheat germ to a water content of up to 12% and to a temperature of up to 150° F. to provide a free-flowing, conditioned wheat germ,

increasing the water content of said conditioned wheat germ to from 12 to 25% by weight, subjecting said conditioned wheat germ having a controlled water content to mechanical working at increased pressures and temperatures for a time effective to cook said wheat germ,

extruding said cooked germ into atmospheric pressure, permitting said wheat germ to expand, and

drying said expanded extruded product to a water level no greater than about 8% by weight.

4,256,770

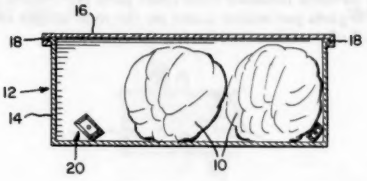
PRESERVATION OF PERISHABLE COMESTIBLES

Don E. Rainey, 4525 NE. 21st Ave., Ft. Lauderdale, Fla. 33308

Continuation of Ser. No. 698,932, Jun. 23, 1976, abandoned, which is a continuation of Ser. No. 522,144, Nov. 8, 1974, abandoned, which is a continuation of Ser. No. 394,810, Sep. 6, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,756

Int. Cl.³ A23B *7/00*

U.S. Cl. 426—124 **7 Claims**



1. A perishable comestible package comprising:

(i) a sealed, air-tight, cold permeable container;

(ii) a perishable comestible product sealedly disposed within said container; and

(iii) a self-contained source of water vapor sealedly disposed within said container, comprising:

(a) a substantially flexible water laden porous element having an aperture therein, and,

(b) a flexible envelope surrounding and substantially contiguous with said porous element whereby substantially all liquid water is confirmed within said porous element and having aperture means therein, for permitting continuous supplying of water vapor to said container while precluding direct contact between said porous element and said comestible.

4,256,771

CONTINUOUS GELATINIZATION PROCESS

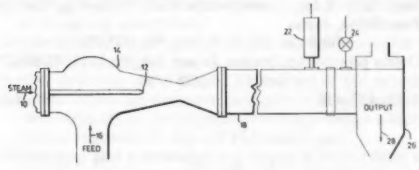
Gary A. Henderson, Cobourg; William J. C. Thompson, St. Catharines, and John T. Thatcher, Mississauga, all of Canada, assignors to General Foods, Limited, Toronto, Canada

Filed Nov. 6, 1978, Ser. No. 957,906

Claims priority, application Canada, Nov. 7, 1977, 290374

Int. Cl.³ A23L *1/27;* **C13L** *1/08*

U.S. Cl. 426—250 **5 Claims**



1. A continuous process for gelatinization of a starch-containing material by the use of steam, comprising the steps of:

(a) continuously directly feeding a particulate starch-containing material in a substantially free-flowing state into a mixing chamber,

(b) continuously and separately directly feeding wet steam into said mixing chamber, said wet steam providing water to said mixing chamber in an amount sufficient to permit gelatinization of said starch-containing material but insufficient to cause the formation of a slurry of said starch-containing material in said process;

(c) mixing said starch-containing material with the wet steam employing a venturi effect to cause turbulence and uniform mixing to raise said starch-containing material temperature to a level sufficient for gelatinization; and

(d) withdrawing a substantially dry gelatinized particulate starch-containing material from said mixing chamber.

4,256,772

FRUIT AND CEREAL PRODUCTS AND PROCESS THEREFOR

Sudhakar P. Shanbhag, Tarrytown, and Alina S. Szczesniak, Mt. Vernon, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 11,729, Feb. 12, 1979, abandoned, which is a continuation of Ser. No. 471,419, Jul. 18, 1973, abandoned, which is a continuation of Ser. No. 239,980, Mar. 31, 1972, abandoned. This application Oct. 9, 1979, Ser. No. 83,185

Int. Cl.³ A23B *7/08;* **A23L** *1/164*

U.S. Cl. 426—331 **7 Claims**

1. A process for preparing a breakfast food having pieces of fruit blended with dry, crisp breakfast cereal particles which comprise the steps of:

(a) preparing the fruit by

(1) infusing the fruit with an aqueous solution of edible polyhydric alcohol and a sugar, said polyhydric alcohol selected from the group consisting of glycerol, mannitol, sorbitol, propylene glycol and mixtures thereof and said sugar selected from the group consisting of dextrose, sucrose and combinations thereof,

(2) drying the infused fruit to a moisture content ranging from about 18% to about 34% by weight, said dry infused fruit having a water activity of from about 0.40 to about 0.65, and then

(3) dusting the infused fruit with a moisture binder to prevent sticking,

(b) blending the dusted, infused fruit with dry breakfast cereal particles having a moisture content of about 1 to 4%, and

(c) packaging the blend of infused fruit and dry breakfast cereal particles whereby the in-package water vapor pressure of the infused fruit pieces and the in-package water vapor pressure of the breakfast cereal particles equate, upon storage, to a value which corresponds to the equilibrium water vapor pressure of the crisp cereal having a moisture content equal to or below its critical moisture.

4,256,773

BROMINATED CARBONACEOUS MOLECULAR SIEVE AND METHOD OF USE THEREFOR

Kiyoshi Itoga; Fumiichi Ogino, both of Kawanishi; Kinichi Shirakawa, and Yasuyuki Soga, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd. and Rengo Co., Ltd., both of Osaka, Japan

Filed Nov. 3, 1978, Ser. No. 957,205

Claims priority, application Japan, Nov. 7, 1977, 52/133817

Int. Cl.³ A23B *7/00;* **B65B** *55/00*

U.S. Cl. 426—415 **9 Claims**

1. A closable container in which is enclosed carbonaceous molecular sieve which carries bromine as adsorbed thereon and has micropores within the range of 4 to 6 Angstrom units in diameter.

5. A method for prolonging the shelf-lives of green perishable foods or flowers which comprises enclosing a green perishable food or flower and a carbonaceous molecular sieve, which carries bromine as adsorbed thereon and has micropores within the range of 4 to 6 Angstrom units in diameter, in a closable container.

4,256,774

DECAFFEINATION PROCESS

Rudolf G. K. Strobel, Cincinnati, and Richard A. Eich, Oxford, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 814,619, Jul. 11, 1977, abandoned, which is a continuation of Ser. No. 681,869, Apr. 29, 1976, abandoned. This application May 24, 1978, Ser. No. 908,887

Int. Cl.[3] A23F *5/20*

U.S. Cl. 426—428 15 Claims

1. A process for decaffeinating green coffee beans, comprising:

hydrating the beans;

contacting the hydrated beans with a solvent system which comprises a decaffeinating amount of benzyl alcohol; and

thereafter removing the decaffeinated beans from contact with the solvent system.

4,256,775

METHOD FOR COOKING FOOD IN A PRESSURE VESSEL

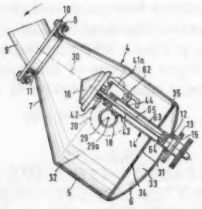
Paul Kunz, Deishardtsr. 3, 5419 Döttesfeld, Fed. Rep. of Germany

Division of Ser. No. 772,158, Feb. 25, 1977, Pat. No. 4,160,445. This application Apr. 2, 1979, Ser. No. 26,257

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610221

Int. Cl.[3] A23L *1/00*

U.S. Cl. 426—508 10 Claims



1. A method of cooking solid food in a pressure vessel which is supported for pivotal movement between first and second portions and in which two separate zones are provided which are separated in a manner to allow passage of liquid but prevent passage of solid food between the two zones as the vessel is pivoted between its first and second positions, said method comprising the steps of:

placing solid food into one of the zones of the vessel;

applying heat to the food to cook it in the vessel;

periodically pivoting the vessel to intermittently wet the food with liquid in the vessel either resulting from the introduction of liquid into the vessel and/or resulting from the cooking process, and to intermittently separate the liquid from the food; and,

removing the food from the vessel when the cooking is completed.

4,256,776

FLAVORING WITH CERTAIN 2-ALKYL-4,5-DIALKYL-Δ^3-THIAZOLINES

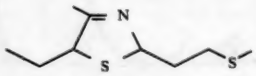
Donald A. Withycombe, Lincroft; Braja D. Mookherjee, Holmdel; Cynthia J. Mussinan, Bricktown; Manfred H. Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 17,579, Mar. 5, 1979, which is a continuation-in-part of Ser. No. 730,156, Oct. 7, 1976, abandoned. This application Sep. 21, 1979, Ser. No. 77,885

Int. Cl.[3] A23L *1/226*

U.S. Cl. 426—535 2 Claims

1. The process of augmenting or enhancing the aroma or taste of a walnut flavored foodstuff comprising adding to said walnut flavored foodstuff from 0.005 parts per million up to about 50 parts per million based on the total weight of said foodstuff of the compound having the structure:



4,256,777

METHOD FOR MAKING FRIED POTATO PIECES HAVING THE PEEL RETAINED THEREON

William D. Weaver, Collinsville, and Warren J. Simon, Idaho Falls, both of Id., assignors to Ampco Foods Inc., San Francisco, Calif.

Filed Apr. 17, 1979, Ser. No. 30,883

Int. Cl.[3] A23L *1/216*

U.S. Cl. 426—637 16 Claims

1. A method for the preparation of a potato product comprising the steps of:

(a) cutting an unpeeled potato into wedge-shaped pieces having a substantially triangular cross-section, the base of which is a section of the exterior surface of said potato having the peel retained thereon and the sides of which have no peel thereon;

(b) cooking said pieces;

(c) parfrying said pieces of step (b);

(d) freezing said pieces of step (c); and

(e) packaging said pieces of step (d);

wherein said pieces have the peel retained on said base throughout steps (a) through (e).

4,256,778

METHOD OF INSPECTING AND RETOUCHING A PHOTO MASK

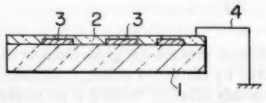
Koichiro Mizukami, Kodaira, and Masatoshi Migitaka, Kokubunji, both of Japan, assignors to VLSI Technology Research Association, Japan

Filed Jul. 18, 1978, Ser. No. 925,791

Claims priority, application Japan, Jul. 25, 1977, 52-88427

Int. Cl.[3] B05D *3/06*

U.S. Cl. 427—10 10 Claims



1. A method of inspecting the mask pattern of a photo mask comprising the step of preparing the photo mask in which at least part of a major surface of a transparent substrate is formed of a conductive transparent substance and in which a plurality of opaque substance films constituting a mask pattern are dis-

posed on said conductive transparent substance, and the step of irradiating said photo mask with an electron beam under a state under which said conductive transparent substance is held at a predetermined potential.

4,256,779

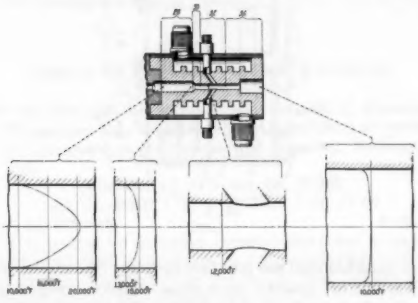
PLASMA SPRAY METHOD AND APPARATUS

Larry S. Sokol, West Palm Beach; Charles C. McComas, Stuart, and Earl M. Hanna, Greenacres, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 974,666, Nov. 3, 1978, which is a continuation of Ser. No. 834,087, Sep. 19, 1977, which is a continuation of Ser. No. 512,585, Oct. 7, 1974. This application Jun. 11, 1979, Ser. No. 47,437

Int. Cl.³ B05D *1/08*

U.S. Cl. 427—34 **25 Claims**



1. In a method for applying a high temperature capability material onto a substrate of the type in which the material to be applied is carried to the substrate in a high energy plasma stream, the improvement which comprises:

providing a stream of high temperature plasma which is characterized by an average temperature in degrees Fahrenheit across the stream and a temperature spike at the center of the stream which has a magnitude approximately one-third ($\frac{1}{3}$) greater in degrees Fahrenheit than the average temperature;

passing the high temperature plasma through an extended cooling zone of sufficient length and of sufficient cooling capacity to achieve an average plasma temperature reduction of approximately ten to fifteen percent (10–15%) as expressed in degrees Fahrenheit and a reduction in the magnitude of the temperature spike to within approximately fifteen percent (15%) as expressed in degrees Fahrenheit of the reduced average temperature;

introducing powders of said high temperature capability material into the reduced temperature plasma stream;

confining the plasma stream and introduced powders within an elongated passageway;

accelerating and heating said introduced powders within the elongated passageway;

further reducing the average temperature of the provided stream within the elongated passageway to approximately two-thirds ($\frac{2}{3}$) of the original provided average temperature as expressed in degrees Fahrenheit; and

discharging said accelerated and heated powders from said elongated passageway and directing said powders against the substrate to be coated.

5. In a plasma generator and spray device of the type for depositing particles of coating material on a substrate and of the type in which the particles of coating material are heated and accelerated by a plasma stream generated within the device, the improvement which comprises:

a plasma generator capable of producing a columnar stream of plasma effluent at an average plasma velocity within the stream which is approximately two thousand feet per second (2000 fps) and at an average plasma temperature which is approximately fifteen thousand degrees Fahrenheit (15,000° F.); and

a coolable nozzle having an elongated passageway therethrough which is adapted to receive said plasma effluent having an average velocity of approximately two thousand feet per second (2000 fps) and an average temperature of approximately fifteen thousand degrees Fahrenheit (15,000° F.) wherein said nozzle has

means having sufficient length and sufficient cooling capacity at the upstream end of the passageway for reducing the average temperature of the plasma stream,

means along the passageway immediately downstream of said temperature reducing means for accelerating the reduced temperature plasma to an average velocity in excess of the average velocity of the plasma at the upstream end of said temperature reducing means,

means along the passageway immediately downstream of said accelerating means for admitting particles of coating material into said cooled and accelerated plasma, and

means along the passageway immediately downstream of said particle admitting means for confining said particles within the cooled and accelerated plasma stream for a sufficient time interval to enable the particles to be heated to a plasticized state.

4,256,780

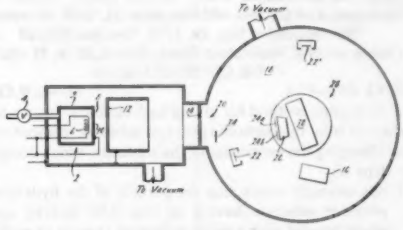
METALLIZATION PROCESS

Martin R. Gaerttner, Dearborn, and David W. Hoffman, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 957,373, Nov. 2, 1978, abandoned, and Ser. No. 957,374, Nov. 2, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,939

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **18 Claims**



1. A deposition process, which comprises:

(A) maintaining a vacuum in a chamber;

(B) providing a substrate in the chamber;

(C) providing depositable vapor comprising transition metal in the vacuum from a vapor source, the vapor normally depositing in tension;

(D) permitting the vapor to contact the substrate to cause a deposit thereon; and

(E) bombarding the deposit with accelerated particles comprising energetic, atomic particles from another source that are sufficient in number and energy so that the internal stress of the deposit is about zero or in compression.

4,256,781

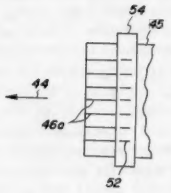
METHOD OF FORMING ELECTRICAL COMPONENTS OVER MAGNETIC IMAGES

Richard J. McClure, San Diego, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Division of Ser. No. 885,928, Mar. 13, 1978, abandoned. This application Mar. 21, 1979, Ser. No. 22,540

Int. Cl.[3] B05D 3/14

U.S. Cl. 427—47 3 Claims



1. A method of making a multi-conductor device having fanned conductive tracks, said method comprising the steps of:

using a multi-track magnetic recording head to record magnetic record tracks on a magnetic record medium;

while not substantially reducing the degree of magnetization of said record medium as effected by means of said head, rotating the multi-track magnetic recording head relative to the magnetic record medium during recording;

contacting said magnetic record tracks with a catalytic magnetic toner which includes an electroless plating catalyst; and

electrolessly plating the toned magnetic record tracks with a conductive material.

4,256,782

TREATING METHOD FOR GIVING HYDROPHILIC PROPERTY TO THE SURFACE OF HYDROPHOBIC POLYMER SUBSTRATE

Shigeo Tazuke, Yokohama; Hitoshi Kimura, and Hiroyuki Nakayama, both of Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Japan

Continuation of Ser. No. 802,010, May 31, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,024

Claims priority, application Japan, Jun. 4, 1976, 51-65271

Int. Cl.[3] B05D 3/06

U.S. Cl. 427—53.1 9 Claims

1. A treating method for giving hydrophilic property to the surface of solid hydrophobic polymer substrate without otherwise changing the properties of the substrate which comprises the steps of:

I. non-mixingly contacting the surface of the hydrophobic polymer substrate having at least 0.05 mol/kg carbon atoms bonded with a single hydrogen atom in its molecule and a contact angle of at least 60° with water with a radically polymerizable compound, the homopolymer of which is soluble and/or swellable in water or in electrolytic solutions said radically polymerizable compound being mixed with a triplet state sensitizer having triplet state energy of 50 Kcal/mol or more or photosensitizer which produces free radicals by irradiation;

II. irradiating actinic rays of wave length 300–700 nm to said polymer substrate applied with said radically polymerizable compound whereby a radical addition reaction occurs to bond said compound to said substrate; and

III. rinsing said treated polymer with a non-solvent for a period of time substantially in excess of that required for removal of an unreacted polymerizable compound.

4,256,783

CATALYTIC VAPOR PHASE OXIDATION REACTOR APPARATUS

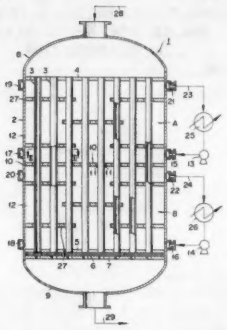
Masahiro Takada; Hiroyuki Uhara, both of Tatsuno, and Takahisa Sato, Himeji, all of Japan, assignors to Nippon Skokubei Kagaku Kogyo Co., Ltd., Koraibashi, Japan

Division of Ser. No. 922,791, Jul. 7, 1978, Pat. No. 4,203,906. This application May 9, 1979, Ser. No. 37,930

Claims priority, application Japan, Jul. 13, 1977, 52-83036; Jul. 14, 1977, 52-83609; Jul. 20, 1977, 52-86010

Int. Cl.[3] B01J 8/06; F28D 7/00; F28F 9/00

U.S. Cl. 422—197 9 Claims



1. A fixed-bed shell and tube heat exchange type reactor for use in exothermic catalytic vapor phase oxidation, comprising: a bundle of a multiplicity of tubes filled with at least one type of oxidizing catalyst disposed in said shell, said tubes being passed through apertures provided in at least one perforated shield plate to partition the inside of said shell into at least two heat transfer medium feed zones in such a manner that each of said tubes passing through said perforated shield plate is not in direct contact with said shield plate, the outer surface of said tube and the inner surface of the apertures provided in said shield plate are spaced apart by a distance of between 0.2–5 mm.

4,256,784

HEAT-SEALABLE PLASTIC FILM

Dieter Gebhardt, and Siegfried Janocha, both of Wiesbaden-Biebrich, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,769

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637978

Int. Cl.[3] B32B 27/08, 7/02

U.S. Cl. 428—216 16 Claims

1. A heat-sealable film, comprising a base film of a polymer or copolymer of an α-olefin having from 2 to 6 carbon atoms in the molecule and applied to at least one surface of the base film, a heat-sealable interpolymer layer comprising a terpolymer comprised of from about

93.2–99.0 percent by weight of propylene units,

0.5–1.9 percent by weight of ethylene units, and

0.5–4.9 percent by weight of units of an α-olefin having from 4 to 10 carbon atoms in the molecule,

and in which the comonomers are substantially statistically randomly distributed.

4,256,785
PELLET COATING PROCESS

Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1979, Ser. No. 60,548
Int. Cl.³ B05D *7/00*
U.S. Cl. 427—222 **5 Claims**

1. Method of making coated particles comprising
(a) forming particles which contain about 20% or more by volume of voids,
(b) contacting the surface of said particles with a polymeric material suspended in a volatile liquid,
(c) reducing the temperature of said particles while in contact with said suspended polymeric material an amount sufficient for the liquid from said suspension to be drawn into the voids of the particles as the outer surface of the particles filters and separates polymer particles to form a surface coating thereof.

4,256,786
CHEMICAL PROTECTIVE, FIRE RESISTANT COMPOSITION

Gil M. Dias, Fall River, Mass., and Armando C. Delasanta, Woonsocket, R.I., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

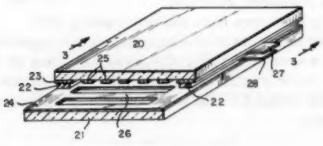
Filed Jul. 11, 1979, Ser. No. 56,581
Int. Cl.³ B05D *3/02, 5/00;* **B32B** *5/18, 27/00*
U.S. Cl. 427—244 **5 Claims**

1. A process for imparting chemical protection properties and fire resistance to a polyurethane foam and textile laminate combination comprising impregnating said foam laminate combination with an aqueous dispersion of:
a. 6.0 to 8.0% by weight ammonium polyphosphate;
b. 1.6 to 4.2% by weight of a carbonific;
c. 23.6 to 25.2% by weight of an active carbon;
d. 2.0 to 2.5% by weight of an anionic type acrylic resin;
e. 0.048 to 0.144% by weight of a dispersing agent for the active carbon;
f. 0.606 to 0.651% by weight of a protective colloid; and
g. Water sufficient to make up 100%; and drying the impregnated polyurethane foam and textile laminate combination.

4,256,787
ORIENTATION OF ORDERED LIQUIDS AND THEIR USE IN DEVICES

David C. Shaver, Cambridge; Henry I. Smith, Sudbury, and Dale C. Flanders, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 3, 1978, Ser. No. 902,332
Int. Cl.³ G02F *1/13*
U.S. Cl. 428—1 **28 Claims**



1. A device comprising
at least two substrate means, at least one of which is transparent, a surface structure formed in a selected pattern on a selected surface of at least one of said substrate means, said selected pattern being such that selected regions of said pattern are formed of a material which is substantially light-transparent and other selected regions thereof are formed of a material having a thickness so as to be substantially light-opaque, a selected dimension of each of said selected regions being in the order of magnitude of the wavelength of light, or less, and the locations thereof being selected so as to provide polarization of light passing through said transparent substrate means, said at least two substrate means being positioned in proximity to each other and forming a spatial region therebetween;
a liquid crystal confined in said spatial region, the surface structure aligning said liquid crystal in accordance with the selected patterns thereof and polarizing light passing through said transparent substrate.

4,256,788
PROCESS FOR THE COATING OF GLASS SURFACES

Rainer Gras, Herne, Fed. Rep. of Germany, assignor to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

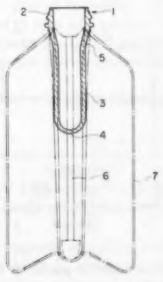
Filed Sep. 29, 1978, Ser. No. 947,042
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746017
Int. Cl.³ B05D *1/38;* **B32B** *17/10;* **B65D** *25/34*
U.S. Cl. 428—35 **18 Claims**

1. A process for the coating of glass surfaces to prevent the strewing of glass particles in case of bursting, with a transparent, duroplastic protective layer of more than 50 microns which comprises
first treating the clean glass surface with an aqueous or alcoholic silane skim coat,
drying said treated surface, and then
coating said dry surface with a paste of aliphatic or cycloaliphatic diisocyanates or mixtures thereof or their reaction products with water in a mole ratio of 2:≦1 and a mixture of hydroxyl-group-containing compounds consisting of
40–80 wt.% trifunctional, hydroxyl-group-containing polyester polyols made of aliphatic or cycloaliphatic dicarboxylic acids or mixtures thereof and a mixture of triols, diols or tricarboxylic acids, with an average molecular weight of 300 to 1400,
15–50 wt.% bifunctional, hydroxy-group-containing polyester polyols from aliphatic or cyloaliphatic dicarboxylic acids or mixtures thereof and diols, with an average molecular weight of 400 to 2000 and, if necessary
2.5–25 wt.% aliphatic or cycloaliphatic diols or mixtures thereof, with respect to the total quantity of polyols.

4,256,789
INJECTION MOLDED, POLYETHYLENE TEREPHTHALATE PARISON FOR BLOW MOLDING

Sadao Suzuki; Masao Akutsu, both of Tokyo, and Akiho Ota, Funabashi, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1979, Ser. No. 58,748
Int. Cl.³ B32B *1/02, 27/36*
U.S. Cl. 428—35 **2 Claims**



1. An injection molded parison (1) of polyethylene terephthalate comprising a neck-forming portion (2) adapted to be clamped by a portion of a blow mold when the parison is placed in the mold, a cylindrical body-forming portion (3)

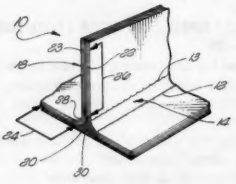
having a semispherical shaped, closed bottom (**4**), and an intermediate taper wall portion (**5**) having the greatest internal and external diameter at the end connected to said neck-forming portion (**2**), and the smallest internal and external diameter at the end connected to said body forming portion (**3**).

4,256,790

REINFORCED COMPOSITE STRUCTURE AND METHOD OF FABRICATION THEREOF

Leslie M. Lackman, Tarzana, and John A. Hill, Lawndale, both of Calif., assignors to Rockwell International Corporation, Los Angeles, Calif.

Filed Jan. 19, 1978, Ser. No. 870,684
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—73 **14 Claims**



1. A reinforced cured composite structure comprising:

a first composite panel, said first panel having a plurality of fiber composite plies, said plies being adhesively bonded together;

a second composite panel, said second panel having a plurality of fiber composite plies, said plies being adhesively bonded together, said second panel being adhesively bonded to said first panel at a joint between said first panel and said second panel; and

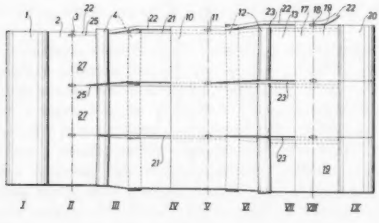
composite thread reinforcing said joint, said thread being sewn in a series of stitches through said first panel and said second panel.

4,256,791

WEBLIKE LAMINATED PACKING MATERIAL AND A METHOD FOR THE MANUFACTURE OF SUCH A MATERIAL

Sven N. H. Holmström, Löberöd, and Knut A. Rosenberg, Lomma, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Nov. 15, 1979, Ser. No. 94,387
Claims priority, application Sweden, Nov. 24, 1978, 7812142
Int. Cl.³ B32B *31/18*
U.S. Cl. 428—77 **10 Claims**



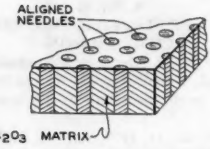
1. In a web-like laminated packing material of the type which may be formed into packing containers capable of holding sterile contents, which packing material has at least one carrier layer, at least one intermediate layer of metal foil, and at least one outer layer of thermoplastic material, the improvement wherein said material includes a strip projecting from at least one of the longitudinal edges of said carrier layer, said edge strip including at least one outer thermoplastic layer and at least one metal foil layer, with the at least one metal foil layer extending beyond at least one longitudinal edge of said at least one carrier layer and the at least one outer thermoplastic layer extending beyond at least one longitudinal edge of said at least one metal foil layer.

4,256,792

COMPOSITE ELECTRONIC SUBSTRATE OF ALUMINA UNIFORMLY NEEDLED THROUGH WITH ALUMINUM NITRIDE

Barry G. Koepke, Mound, and Kelly D. McHenry, Eden Praire, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 25, 1980, Ser. No. 115,525
Int. Cl.³ B32B *5/08, 19/00;* **C04B** *33/14, 35/58;* **H01L** *23/36*
U.S. Cl. 428—119 **3 Claims**



1. A composite dielectric ceramic substrate structure for use in micropackage assembly and having anisotropic thermal properties comprising a matrix of aluminum oxide (Al_2O_3) containing aluminum nitride (AlN) needle-like elements distributed throughout the substrate, the AlN elements having a higher thermal conductivity than the Al_2O_3, the AlN needles being aligned parallel to the short transverse dimension of the substrate to thereby serve as solid state heat pipes through the substrate and provide anisotropic thermal properties in the substrate.

3. A process for fabricating an Al_2O_3—AlN composite electronic substrate with anisotropic thermal properties comprising the steps of:

providing a slurry of aluminum oxide powder, solvent, plasticiser and binder;

providing a quantity of needles of aluminum nitride, said aluminum nitride having a high thermal conductivity compared to the aluminum oxide, and adding the aluminum nitride needles to said slurry;

tape casting said slurry onto an organic carrier film;

heating and drying said tape cast slurry;

applying an electric field to said tape cast slurry while heating and drying to orient and align said aluminum nitride needles through the thickness of the tape parallel to its short transverse direction;

selecting substrates from the tape casting; and

firing the substrates to eliminate the organic materials and to form a sintered ceramic composite consisting of an aluminum oxide matrix containing aluminum nitride needles aligned parallel to the short transverse dimension of the ceramic.

4,256,793

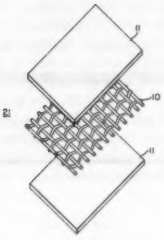
EMBOSSING ASSEMBLY FOR HIGH PRESSURE LAMINATE SURFACES

Daniel L. Cannady, Jr., Allendale, S.C., and Salvatore E. Palazzolo, Elizabeth City, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1975, Ser. No. 552,831
Int. Cl.³ B32B *3/10*
U.S. Cl. 428—137 **2 Claims**

1. An embossing assembly for use in making high pressure

decorative laminates consisting of an open patterned embossing sheet able to resist temperatures of up to 175° C. and pressures of up to 1500 psi without substantial deformation, said embossing sheet having a patterned thickness of between about 0.025 inch to 0.250 inch, and being disposed between two exterior fibrous layers which comprise at least one sheet of fibrous material selected from the group consisting of kraft paper, sulfite kraft paper, alpha-cellulose paper, cotton linter paper, rag paper, asbestos paper, cotton, glass cloth and linen cloth, said fibrous layers being impregnated with a resinous material which also impregnates the interior of the open patterned embossing sheet, said resinous material being selected from the group consisting of phenolic resin, epoxy resin, polyester resin, aminoplastic resin, amide-imide resin, imide resin



and aromatic polysulfone resin, wherein the resin ratio in the exterior fibrous layers is between about 1.5 to 2.0 and the thickness ratio of each exterior fibrous layer: embossing sheet is from about 1:2.5 to 1:12, said assembly being heat and pressure consolidated into a unitary bonded structure having smooth edges, and two solid, flexible, exterior fibrous surface layers with protrusions and indentations sharply and deeply conforming to the patterned, 0.025 inch to 0.250 inch surface and openings of the embossing sheet pattern; said assembly having the property, during making a laminate, of being able to resist pressures of up to 1500 psi without rupture of the exterior impregnated fibrous layers and of transferring the pattern to provide a sharp, deep embossing after separation from the laminate.

4,256,794

BLOCKING FOIL

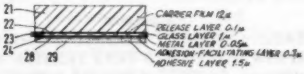
Fritz Meisel, Fürth, Fed. Rep. of Germany, assignor to Messrs. Leonhard Kurz, Fürth, Fed. Rep. of Germany

Filed Jan. 5, 1979, Ser. No. 1,296

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800635

Int. Cl.³ B32B *3/00, 15/08*

U.S. Cl. 428—195 **5 Claims**



1. A blocking foil comprising a carrier film, a covering layer, a release layer releaseably connecting said covering layer to said carrier film, an adhesive layer for securing said covering layer to a substrate, said adhesive layer being disposed on the side of said covering layer remote from said carrier film, and an adhesion-facilitating layer connecting said adhesive layer to said covering layer, said covering layer comprising a layer of glass deposited by high vacuum vaporization and also comprising a metal layer disposed on said glass layer on that side which is remote from said carrier film.

4,256,795

HEAT TRANSFERS

Ian H. Day, Southall; William A. Baldwin, and Harold J. Stern, both of London, all of England, assignors to Polymark Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 627,730, Nov. 24, 1975, abandoned. This application May 27, 1977, Ser. No. 801,275

Claims priority, application United Kingdom, Nov. 5, 1974, 47867/74

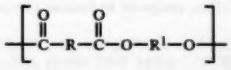
Int. Cl.³ B32B *3/00*

U.S. Cl. 428—196 **26 Claims**

1. A heat transfer comprising a temporary support and a label carried on said support, said label comprising a layer of a polyurethane resin system including

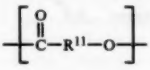
(a) a thermoplastic polyurethane elastomer which is the product of the reaction of

(1) 1 mole of an essentially linear hydroxyl terminated polyester either of the formula:



R is an alkylene radical of 2 to 8 carbon atoms and R^1 is an alkylene radical of 4 to 10 carbon atoms,

or of the formula:



wherein:

R^{11} is an alkylene radical of 4 to 8 carbon atoms,

said linear polyester having an average molecular weight of 600 to 3000 and an acid number less than 10;

(2) from 1.1 to 3.1 moles of diphenyl diisocyanate having an isocyanate group on each phenyl nucleus; and

(3) from 0.1 to 2.1 moles of at least one free glycol of from 2 to 10 carbon atoms;

the combined average hydroxyl number molecular weight of the polyester and the free glycol being 450 to 1200, and the molar amount of the polyester and glycol combined being essentially equivalent to the molar amount of the diisocyanate compound;

(b) an acid or acid yielding catalyst; and

(c) as a cross-linking agent a compound containing at least two N-alkoxymethyl groups;

said layer of the polyurethane resin system being substantially noncross-linking at ambient temperatures with said polyurethane remaining uncured, and when the layer of the polyurethane resin system is placed in contact with an article to be marked and subjected to heat and pressure the polyurethane is rapidly cross-linked into an inert, insoluble, extensible and wear-resistant form to provide a substantially permanent marking on the article.

25. An article marked with a heat transfer according to claim 1.

4,256,796

PARTIALLY DEVITRIFIED PORCELAIN COMPOSITION AND ARTICLES PREPARED WITH SAME

Kenneth W. Hang, Princeton Junction, and Wayne M. Anderson, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,091

Int. Cl.³ B32B *3/00*; C03C *3/22, 5/02*

U.S. Cl. 428—210 **12 Claims**

7. A porcelain coated circuit board having a metal core and having applied to the surface of the metal core a coating of a

devitrified porcelain which is free to substantially free of alkaline metal oxide, said porcelain consisting essentially, on an oxide basis, of:

(a) from about 6 to about 25 mole percent of barium oxide;
(b) from about 30 to about 60 mole percent of MO wherein MO is a member selected from the group consisting of magnesium oxide and mixtures of magnesium oxide with at least one member selected from the group consisting of zinc oxide and calcium oxide;
(c) from about 13 to about 35 mole percent of boron trioxide; and
(d) from about 10 to about 25 mole percent of silicon dioxide;

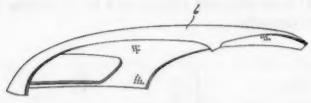
said coating having a deformation temperature of at least 700° C. and said coating of porcelain having defined thereon an electrical circuit.

4,256,797

CONTOURED RESILIENT VEHICLE TRIM PANEL

Richard W. Stamper, Toledo, and Richard A. Rhonehouse, Holland, both of Ohio, assignors to Inmont Corporation, Clifton, N.J.

Filed Sep. 2, 1976, Ser. No. 719,977
Int. Cl.[3] B32B *7/02;* **B60J** *7/00;* **B29D** *27/00;* **B32B** *5/18*
U.S. Cl. 428—215 **7 Claims**



1. A contoured resilient vehicle trim panel comprising a composite laminar sheet consisting of a pair of inperforate thermoplastic films disposed in spaced-apart relationship and tenaciously bonded in supported relationship to the face surfaces of an intervening coextensive thermoplastic foam layer, said films being of a thickness of about 3 mils to about 60 mils and said foam core layer being of a thickness of about 1/32 to about 1 inch and of a density of about 3 to about 6 pounds per cubic foot, said foam core layer composed of a thermoplastic polymer consisting of a modified polystyrene copolymer containing from about 2% to about 15% by weight maleic anhydride having a tensile strength of at least 7,800 psi, and a tensile modulus of at least 4.5×10^5 psi; said films composed of a thermoplastic polymer consisting of a modified polystyrene copolymer containing from about 2% to about 15% by weight maleic anhydride and about 6% to about 12% by weight butadiene having a tensile strength of at least 4,500 psi, a tensile modulus of at least 3.2×10^5, and an Izod impact strength of at least about 2.7 foot pounds per inch; said thermoplastic polymer of said foam core layer and said films having a glass transition temperature of at least 235° F.

4,256,798

MOISTURE-RESISTANT FIRE-RETARDANT DECORATIVE FLOOR AND WALL COVERINGS AND PROCESS FOR THE MANUFACTURE THEREOF

Alvin E. Witt, Media, and Lewis R. Bosco, Lemont, both of Pa., assignors to PermaGrain Products, Inc., Media, Pa.

Filed Dec. 5, 1978, Ser. No. 966,553
Int. Cl.[3] B32B *7/02, 19/08, 21/04*
U.S. Cl. 428—215 **9 Claims**

1. A moisture-resistant, fire-retardant laminate for use as a floor and wall covering, comprising

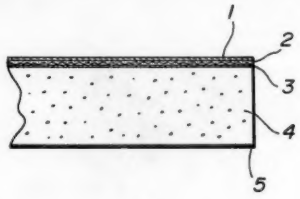
(a) a moisture-transmitting, flexible, asbestos-containing backing layer;
(b) an intermediate layer of wood veneer having a thickness in the range from about 1/85" up to about 1/45"; and
(c) an outer wear layer of see-through vinyl having a thickness in the range from about 6 to about 20 mils and a cold crack temperature in the range from about −25° F. to about 32° F.; said layers being adhesively laminated together to form a unitary laminate having the appearance of wood but highly fire-retardant and capable of transmitting moisture in contact with said backing layer to the edges of said laminate.

4,256,799

FIREPROOF LAMINATES

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara, and Akira Suzuki, Hidaka, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1979, Ser. No. 68,290
Claims priority, application Japan, Aug. 18, 1978, 53/100776
Int. Cl.[3] B32B *5/20*
U.S. Cl. 428—215 **17 Claims**



1. A fireproof laminate comprising a urethane modified polyisocyanurate foam as a core material and surface materials piled on both sides of the foam and having a fireproof property which passes Grade 2 incombustibility according to Japanese Industrial Standard A-1321 combustion test, which comprises:

(a) a three-layer assembly composed of an asbestos paper as an upper layer, a matted or woven glass fiber as a middle layer and a metal foil having a thickness of less than 0.1 mm as a lower layer as a front surface material for said core material, said front surface material being united with said core material through said metal foil by self-adhesion of said foam;
(b) an aluminum foil having a thickness of not more than 0.1 mm as a back surface material for said core material;
(c) said core material being rigid and produced by reacting an organic polyisocyanate with a polyol having a hydroxyl equivalent of 30 to 2,000 in an amount of 0.05 to 0.5 equivalent per isocyanate group of said organic polyisocyanate in the presence of an isocyanate polymerization catalyst selected from the group consisting of (i) an alkali metal salt of a carboxylic acid having 2 to 12 carbon atoms and (ii) said alkali metal carboxylic acid salt and a combination of tertiary amino compound therewith, a blowing agent and if necessary, other additives, and having a density of 0.02–0.04 g/cm^3 and
(d) said laminate having a total thickness of not more than 30 mm.

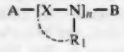
4,256,800

ANTISTATIC AGENTS FOR COATING THE BACKING OF CARPETS AND OTHER FLAT TEXTILE ARTICLES

Dolf Stockhausen, Krefeld, and Reinmar Peppmöller, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 694,415, Jun. 9, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,399
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529939
Int. Cl.[2] A47G *27/02;* **C09K** *3/16;* **C07C** *101/26;* **C08F** *20/06*
U.S. Cl. 428—245 **48 Claims**

1. An antistatic agent containing water or an organic solvent and an antistatically effective amount of a salt of a polymeric acid with an oxalkylated or aminealkylated amine of the general formula



wherein
A=H, $-OR_2$ or

R_1 is a lower alkyl, hydroxyalkyl, aminoalkyl, polyalkyleneimine or polyalkylene glycol ether radical;
R_2 is a lower alkyl radical, hydroxyalkyl, aminoalkyl, polyalkyleneimine or polyglycol ether radical;
R_3 is a lower alkyl radical, hydroxyalkyl, aminoalkyl, polyalkyleneimine or polyalkylene glycol ether radical;
R_4 is a lower alkyl radical, hydroxyalkyl, aminoalkyl, polyalkyleneimine or polyalkylene glycol ether radical;
X is a bivalent alkylene radical having 1 to 6 carbon atoms;
B is a lower alkyl radical, a hydroxyalkyl, aminoalkyl, polyalkylene glycol ether or polyalkylene imine radical;
n=an integer from 1 to 6 wherein when n=1 the group

may be a bivalent 5- or 6-membered heterocyclic radical having 1 or more hetero atoms,
at least one of the radicals R_1, R_2, R_3, R_4, and B being a polyalkylene imine or polyalkylene glycol ether radical.

4,256,801

CARBON FIBER/FLAME-RESISTANT ORGANIC FIBER SHEET AS A FRICTION MATERIAL

Philip A. Chuluda, Oxford, Conn., assignor to Raybestos-Manhattan, Incorporated, Trumbull, Conn.

Filed Dec. 14, 1979, Ser. No. 103,421
Int. Cl.³ D04H *1/08*
U.S. Cl. 428—280 **21 Claims**

1. Friction material in porous, flexible, interfelted fibrous sheet form comprising a mixture of from about 25 to about 65 percent cellulose fibers, from about 5 to about 20 percent of carbon fibers, from about 5 to about 20 percent of flame-resistant organic fibers, up to about 30 percent of graphite particles, up to about 30 percent of diatomaceous earth particles, and a small amount of a sizing effective to increase the tensile strength of said sheet, said percentages being by weight based on the total weight of said sheet.

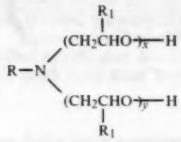
4,256,802

PROCESS FOR POLYISOCYANURATE FOAMS SUITABLE FOR PANELS

Charles E. Koehler, Baytown; Thomas R. McClellan, Seabrook, and Pat L. Murray, Houston, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

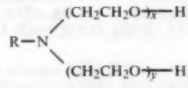
Continuation-in-part of Ser. No. 47,019, Jun. 11, 1979, abandoned. This application Mar. 5, 1980, Ser. No. 127,478
Int. Cl.³ B32B *5/18;* **C08G** *18/30, 18/14, 18/48*
U.S. Cl. 428—310 **10 Claims**

1. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is an isocyanurate moiety said process comprising the trimerization of an organic polyisocyanate in the presence of a minor amount of a polyol, a blowing agent, and a trimerization catalyst, the improvement which comprises preparing said cellular polymer by bringing together:
A. an organic polyisocyanate; and
B. from about 10 to about 120 parts by weight per equivalent of said polyisocyanate of a blend comprising:
(a) about 2 to about 20 percent by weight of a polyisocyanate trimerization catalyst, and
(b) about 80 to about 98 percent by weight of a mixture comprising:
1. about 20 to about 80 percent by weight of a fluorocarbon blowing agent, and
2. about 20 to about 80 percent by weight of a polyol component comprising an amine diol or mixture of amine diols selected from the formula



wherein R is an aliphatic radical having from 8 to 18 carbon atoms, inclusive, each R_1 is independently selected from the group consisting of hydrogen or methyl, x and y each independently have an average value from about 1 to about 15 inclusive; and
provided the total hydroxyl equivalents present in said blend (B) are within a range of from about 0.05 to about 0.5 equivalent per equivalent of said polyisocyanate.

3. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is an isocyanurate moiety said process comprising the trimerization of an organic polyisocyanate in the presence of a minor amount of a polyol, a blowing agent, and a trimerization catalyst, the improvement which comprises preparing said cellular polymer by bringing together:
A. an organic polyisocyanate; and
B. from about 10 to about 120 parts by weight per equivalent of said polyisocyanate of a miscible blend comprising:
(a) about 2 to about 20 percent by weight of a polyisocyanate trimerization catalyst, and
(b) about 80 to about 98 percent by weight of a mixture comprising:
1. at least about 25 percent by weight of a fluorocarbon blowing agent, and
2. the balance being a polyol mixture comprising:
(i) about 20 to about 85 percent by weight of an amine diol, or mixture of amine diols selected from the formula



wherein R is an aliphatic radical having from 8 to 18 carbon atoms, inclusive, and x and y each independently have an average value from about 4 to about 15 inclusive; and
(ii) about 15 to about 80 percent by weight of a primary hydroxyl polyol characterized by a molecular weight of from about 60 to about 1000; and
provided the total hydroxyl equivalents present in said blend (B) are within a range of from about 0.05 to about 0.5 equivalent per equivalent of said polyisocyanate.

10. A laminate panel comprising a foam core made in accordance with the process set forth in claim **3** and having the opposing faces of said core bonded to a facing material.

4,256,803

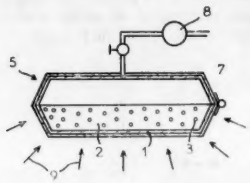
PANEL BASED ON POLYCONDENSABLE RESIN AND A METHOD FOR THE MANUFACTURE OF THIS PANEL

Claude Savey, and Florent Laurent, both of Bersee, France, assignors to Societe Anonyme dite Stratiforme, Nord, France

Filed Jan. 11, 1979, Ser. No. 2,733

Int. Cl.[3] B32B *5/20, 17/04, 23/18;* B29D *27/04*

U.S. Cl. 428—315 14 Claims



1. A process of making a panel which comprises:

forming a fluid mixture of phenolic resin, a hardening agent, a surface active agent and a volatile liquid pore forming agent having a boiling point above ambient temperature during mixing and below the polycondensation temperature of said mixture,

uniformly mixing said mixture with solid fillers in particulate form,

partially filling a mould with said fluid mixture with said fillers therein and closing said mould,

progressively raising the temperature of said mixture to a temperature in the vicinity of the boiling point of said pore forming agent and maintaining said mixture at said temperature to produce expansion of said mixture to fill said mould, and

thereafter progressively raising the temperature of said mixture to the polycondensation temperature of said mixture to effect polycondensation of said mixture.

4. A process according to claim 1, in which the walls of said mould are covered with a layer of phenolic resin prior to the introduction of said fillers and mixture into said mould.

14. A panel made by the process of claim 4.

4,256,804

WATERPROOF COATING COMPOSITION

F. Bon Jasperson, 4121 NE. 26 Ave., Ft. Lauderdale, Fla. 33308

Division of Ser. No. 854,204, Nov. 23, 1977, Pat. No. 4,146,672, which is a continuation of Ser. No. 747,801, Dec. 6, 1976, abandoned. This application Nov. 16, 1978, Ser. No. 961,201

Int. Cl.[3] B32B *27/00;* E04B *1/64*

U.S. Cl. 428—332 11 Claims

1. Process for waterproofing an exterior surface, said process comprising applying to said exterior surface a polymer-rich latex coating composition, said latex coating composition containing at least 40% by weight of film-forming polymer, said polymer selected from the group consisting of acrylic polymers and vinyl polymers, and permitting said latex composition to dry to form a dried residue coating, the dried residue coating being no less than 2–4 mils thick and no greater than about 50 mils thick and containing at least 80% by weight of said film-forming polymer and adhered to said substrate, said latex coating composition having a pigment volume concentration no greater than 10, said dried residue coating having a Mar Elasticity Value of at least 1, and a dry and wet adhesion such as to maintain the film adhesion to said exterior surface under normal atmospheric conditions.

4,256,805

POWDERY COATING COMPOSITION AND PROCESS FOR PREPARING THE SAME

Hideyoshi Tugukuni, Sakai, and Masafumi Kano, Nagaokakyo, both of Japan, assignors to Dai Nippon Tokyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 918,554, Jun. 23, 1978, abandoned, which is a division of Ser. No. 683,508, May 5, 1976, Pat. No. 4,113,917, which is a division of Ser. No. 400,621, Sep. 25, 1973, Pat. No. 3,970,725. This application Aug. 7, 1979, Ser. No. 64,631

Claims priority, application Japan, Sep. 26, 1972, 47-96541; Oct. 28, 1972, 47-108306

Int. Cl.[3] B32B *5/16*

U.S. Cl. 428—357 3 Claims

1. A powdery coating composition comprising polymer particles having an average particle size within the range of 0.5 to 200μ, said particles consisting of, as a core component, a powdery polymer having a softening point from 20° to 90° C. and selected from the group consisting of acrylic copolymers containing 5 to 60% by weight of units of a monomer whose homopolymer has a Tg lower than 0° C. and polyurethane resins and, as an outer component, a copolymer of styrene and maleic acid, said copolymer having a softening point of at least 100° C., wherein the weight ratio of the core component to the outer component is within the range of 50/50 to 100/1 and said outer component covers said core component.

4,256,806

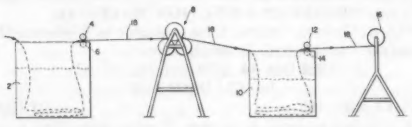
SMUDGE FREE GRAPHITE COATED POLYMERIC SUBSTRATE AND A METHOD FOR PREPARING THE SAME

Ritchie A. Snyder, Elkton, Md., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jul. 5, 1979, Ser. No. 54,679

Int. Cl.[3] D02G *3/00;* B05D *1/00, 3/00, 3/12*

U.S. Cl. 428—378 16 Claims



13. A process for manufacturing a packing material comprising:

(a) coating a plurality of polymeric substrates with a smudge-free, even coating of composition of (i) 14–45 parts graphite; (ii) 15–60 parts liquid lubricant; and (ii) 25–80 parts polytetrafluoroethylene fine powder dispersion containing approximately 60% solids; and

(b) braiding said polymeric substrates together to form a packing material.

15. A product produced according to the process of claim 13.

4,256,807

SYNTHETIC LATEX MODIFIED PULP INSULATED CONDUCTORS

John A. Jukes, Hough, England; Thomas C. Pound, Hudson, and Wayne A. Cascarano, Otterburn Park, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

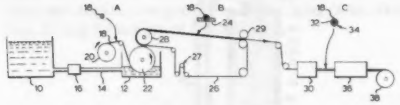
Continuation-in-part of Ser. No. 926,309, Jul. 20, 1978, abandoned, which is a division of Ser. No. 617,324, Sep. 29, 1975, Pat. No. 4,125,645. This application Aug. 23, 1979, Ser. No. 69,069

Int. Cl.[3] D02G *3/00;* H01B *7/02*

U.S. Cl. 428—379 9 Claims

1. An electric wire conductor having an insulation of ex-

panded wood pulp, the fibers of the wood pulp surrounded by an inner coating of an aqueous based cationic deposition aid polymer and an outer coating of an aqueous based anionic latex



polymer, both layers being devoid of a polyvalent metal salt, to produce a dielectric constant comparable to a conventional non-coated pulp insulation of greater thickness.

4,256,808

METHOD AND MEANS FOR REDUCING HEAT TRANSMISSION THROUGH A WINDOW

Ram B. Roy, Nyköping; Lars B. Östehsson, Trosa, and Rolf B. Westin, Nyköping, all of Sweden, assignors to Studsvik Energiteknik AB, Nyköping, Sweden

Filed Mar. 7, 1979, Ser. No. 18,128

Claims priority, application Sweden, Mar. 7, 1978, 7802583

Int. Cl.³ B32B *17/10, 27/30*

U.S. Cl. 428—421 **8 Claims**

8. A plastic film for reducing heat transmission through a window in a heated building in a direction from the interior of the building to the building surroundings, while simultaneously maintaining complete visibility through the window both in, as well as against said direction, said window having at least one window pane, and said plasic film comprising:

a first film, said first film having dimensions corresponding to the dimensions of said window pane, and said first film being adapted to be attached to said window pane; and

a second film, said second film having dimensions corresponding to the dimensions of said window pane, and said second film being attached to said first film;

wherein one of said first and second films comprise a polyethylene terephthalate film, and further wherein the other of said first and second films comprises a polyvinyl fluoride film.

4,256,809

AMBIENT OR LOW-TEMPERATURE CURABLE COATINGS FOR LEATHER AND OTHER FLEXIBLE SUBSTRATES

Bjorn E. Larsson, Rushland, and Fred A. Desiderio, Cornwells Heights, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 2, 1979, Ser. No. 9,022

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—473 **23 Claims**

13. A process for producing an improved fully finished flexible material selected from the group consisting of leather and a leather substitute material comprising the steps of:

a. applying to the flexible material at least one first finish coat which consists of a soft, flexible, resinous binder which may optionally contain pigment and drying the resulting first finish coated material;

b. applying to the dried first finish coated material at least one second, plate or embossing coat and drying the second plating coated material;

c. applying to the dried first and second-coated material a third color coat comprising a film-forming acrylic polymer containing pigment dispersed therein and drying the third color coated material; and

d. applying to the dried first and second and third-coated material a fourth top coat comprising an ambient or low-temperature curable composition comprising an aqueous dispersion of (1) an emulsion polymer having a plurality of reactive aldehyde groups and (2) a curing agent having a plurality of a member selected from the group consisting of hydrazide groups, represented by the formula $H_2N—NH—C(O)—$, and hydrazone groups, represented by the formula $R^1R^2C=N—NH—C(O)—$, wherein R^1 and R^2 are selected from the group consisting of H and alkyl groups, the ratio of hydrazide groups or of hydrazone groups to aldehyde groups of the polymer in the dispersion being from about 1:2 to 2:1, and drying the fourth top coated material.

17. An article of manufacture produced by the process of claim 13.

4,256,810

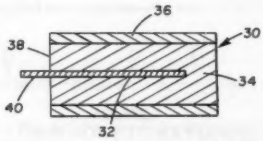
HIGH CONDUCTIVITY TITANIUM ELECTRODE

James H. Doubrava, South Euclid, and Edward L. Thellmann, Walton Hills, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 4, 1978, Ser. No. 966,092

Int. Cl.³ B32B *5/20;* **B22F** *3/14, 3/16*

U.S. Cl. 428—550 **6 Claims**



1. An electrically conductive composite electrode comprising an inner layer of an electrically conductive material, a first outer layer of pressed and sintered powdered titanium metallurgically bonded thereto, and a second outer layer of sintered porous powdered titanium bonded to at least a portion of the surface of the first outer layer, said first outer layer of powdered titanium being compacted to a degree sufficient to render it essentially impermeable to aqueous brine and the surface of the second outer layer of titanium being porous and having an apparent density of from about 30 to 90 percent.

4,256,811

COATING COMPOSITION FOR STEEL CONTAINING ZINC METAL, ZINC OXIDE, MOLYBDENUM SULFIDE, A RESIN AND A SOLVENT

Archie L. Black, Dandenong, Australia, assignor to Placer Exploration Limited, Dandenong, Australia

Filed Jul. 16, 1979, Ser. No. 57,750

Claims priority, application Australia, Jul. 28, 1978, PD5269

Int. Cl.³ C09D *5/08;* **C10M** *7/26;* **B22F** *7/04*

U.S. Cl. 428—562 **10 Claims**

1. A solid lubricant and corrosion inhibiting composition comprising 5 to 20 parts by weight of zinc metal, 1 to 20 parts by weight of zinc oxide and 10 to 40 parts by weight of molybdenum sulfide dispersed in resin and solvent carrier.

4,256,812

SEALED TYPE BATTERY

Kazuhiro Tamura, and Saburo Ninomiya, both of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Oct. 24, 1979, Ser. No. 87,774

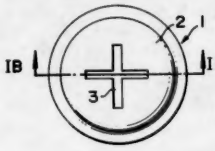
Claims priority, application Japan, May 31, 1979, 54-74292[U]

Int. Cl.³ H01M *2/12*

U.S. Cl. 429—56 **2 Claims**

1. A sealed button type battery comprising a battery can, a positive active substance, a separator impregnated with an electrolyte, a negative active substance and a battery cover, and wherein a cruciform incision is made on a metal plate forming the battery can, said incision being arranged proximal the positive active substance and being V-shaped in cross-sec-

tion with an incision angle of about 90° and with a tip radius of from about 0.1 to 0.2 mm so as to form a wedge-shaped, X-shaped tip presenting a thin part at the cruciform intersection,



said metal plate being about 0.3 to 0.5 mm thick and the incised thin part being about ⅓ to 1/6 of the thickness of the metal plate.

4,256,813

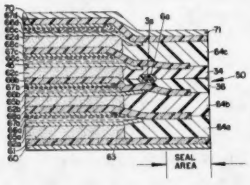
METHOD AND APPARATUS FOR MANUFACTURING BATTERY VENTS AND VENTED BATTERIES

Alfredo G. Kniazzeh, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 852,920, Nov. 18, 1977, which is a continuation-in-part of Ser. No. 761,653, Jan. 24, 1977, abandoned. This application Jan. 21, 1980, Ser. No. 113,551

Int. Cl.³ H01M *2/12*

U.S. Cl. 429—86 **24 Claims**



1. A battery vent, comprising an elongated tube of liquid impervious, hydrogen permeable thermoplastic material filled with a thin, narrow elongated strip of paper, said tube being open at at least one end.

4,256,814

PHOTOELECTRO-CHEMICAL CELL SYSTEM

Yitzhak Avigal, Givataim; David Cahen, Rehovot; Gary Hodes, Rehovot, and Joost Manassen, Rehovot, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

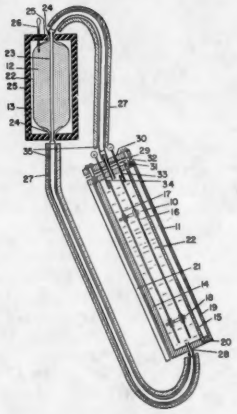
Filed Aug. 21, 1979, Ser. No. 68,450

Claims priority, application Israel, Sep. 1, 1978, 55477

Int. Cl.³ H01M *6/30*

U.S. Cl. 429—111 **13 Claims**

1. A system comprising a photoelectro-chemical cell containing an electrolyte for converting light into electrical energy, said photoelectro-chemical system further comprising



thermosyphon means for circulating said electrolyte throughout said system.

4,256,815

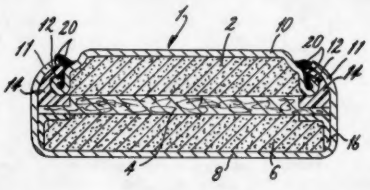
SEALS FOR ELECTROCHEMICAL CELLS

Nicholas J. Smilanich, Rocky River, and Samuel F. Reichert, Brunswick, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 21, 1980, Ser. No. 114,078

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—185 **6 Claims**



1. A sealed electrochemical cell comprising a cathode material, an anodic material and an electrolyte housed in a container sealed at its open end by a closure means which comprises a cover and a nonconductive gasket at least partially coated with a polyamide-containing material, said coated gasket being disposed and compressed between the interface of the cover and the container; the improvement being a bead of a polyamide adhesive disposed on the top edge of the gasket and extending over to contact the edge of the container and the edge of the cover.

4,256,816

MASK STRUCTURE FOR DEPOSITING PATTERNED THIN FILMS

La Rue N. Dunkleberger, High Bridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 841,797, Oct. 13, 1977, Pat. No. 4,218,532. This application Feb. 7, 1980, Ser. No. 119,415

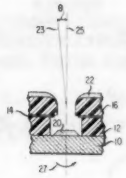
Int. Cl.³ G03C *5/00*

U.S. Cl. 430—11 **4 Claims**

1. A structure for depositing patterned layers comprising: a substrate;

a first layer of positive-acting photoresist material which has been completely exposed by optical radiation;

a protective second layer approximately 50–200 Angstroms thick of metal material vacuum deposited on said first layer and effective to protect said first layer from dissolution during formation of a third layer;



a third layer of positive-acting photoresist material formed on said protective second layer; and

said first, second and third layers having substantially aligned apertures therein which expose a portion of said substrate, the aperture in said first layer being larger than that in said third layer and the aperture in said second layer being at least as large as that in said third layer.

4,256,817

METHOD OF STABILIZING ORGANIC SUBSTRATE MATERIALS INCLUDING PHOTOGRAPHIC DYE IMAGES TO LIGHT AND A PHOTOGRAPHIC MATERIAL SO STABILIZED

Hiroshi Hara, Asaka; Kotaro Nakamura, and Yoshiaki Suzuki, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

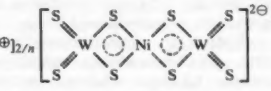
Filed Dec. 14, 1978, Ser. No. 969,519

Claims priority, application Japan, Dec. 14, 1977, 52-150346

Int. Cl.³ G03C *1/40, 1/84, 7/00, 1/10*

U.S. Cl. 430—17 **16 Claims**

8. A color photographic material comprising at least one layer containing a photographic dye image, said dye of said dye image having an absorption maximum in the wavelength range between about 300 nm and about 800 nm, wherein said layer or an adjacent layer thereto contains at least one metal complex salt represented by the general formula (I)



(I)

wherein n is 1 or 2 and Cat represents a divalent cation where n is 2 or a monovalent cation where n is 1, stabilizing said dye to the action of light.

4,256,818

MAGNETIC OR ELECTROSTATOGRAPHIC IMAGING AND HIGH SPEED FUSING METHOD USES POLYAMIDE RESIN IN TONER

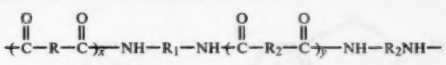
Daniel F. Blossey, Penfield; Peter F. Erhardt, Webster; Charles G. Dickerson, Farmington; Donald S. Sypula, Fairport, all of N.Y.; James E. Kuder, Fanwood, N.J., and J. Kirk Swigert, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1979, Ser. No. 91,295

Int. Cl.³ G03G *11/00, 19/00*

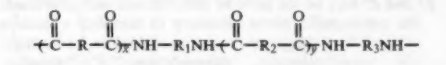
U.S. Cl. 430—39 **2 Claims**

1. A method for developing electrostatographic images by causing the formation of an electrostatic latent image on a photoreceptor surface, followed by contacting the latent image with a developer composition comprised of an improved toner, and a carrier material, said improved toner consisting of a colorant, or pigment, and a polyamide resin of the formula:



wherein R, R_1, R_2, and R_3 are independently selected from aliphatic radicals containing from about 1 to about 30 carbon atoms, aromatic radicals containing from 6 to about 24 carbon atoms and x is a number of from about 10 to about 35, y is a number of from about 10 to about 35, followed by transferring the developed image to a substrate and fusing the image to said substrate wherein fusing is accomplished at a rate of between about 20 inches per second to about 50 inches per second.

2. An improved method for developing magnetic latent images by causing the formation of a magentic latent image on a suitable substrate, followed by contacting the image with a developer composition comprised of an improved magnetic toner and a carrier material, said improved toner consisting of a magnetic material and a polyamide resin of the formula



wherein R, R_1, R_2, and R_3, are independently selected from aliphatic radicals containing from about 1 to about 30 carbon atoms, aromatic radicals containing from 6 to about 24 carbon atoms, and x is a number of from about 10 to about 35, y is a number of from about 10 to about 35, followed by transferring the developed image to a substrate, and fusing the image to said substrate wherein fusing is accomplished at a rate of between about 20 inches per second to about 50 inches per second.

4,256,819

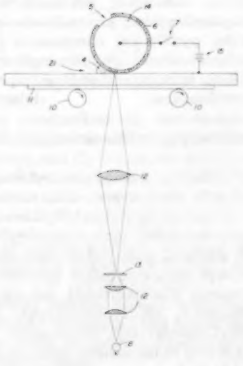
ORGANIC ELECTROPHOTOSENSITIVE MATERIALS FOR MIGRATION IMAGING PROCESSES

Frank G. Webster, Rochester, and Michael T. Regan, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 818,695, Jul. 25, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,675

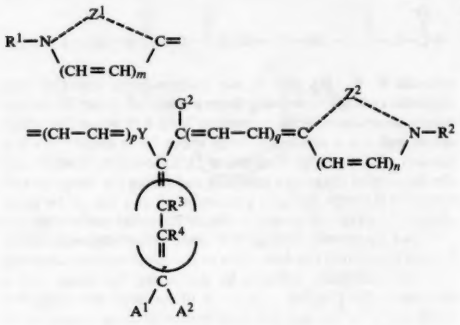
Int. Cl.³ G03G *13/24*

U.S. Cl. 430—41 **6 Claims**



1. An electrophoretic migration imaging process which comprises subjecting an electrically photosensitive colorant material positioned between at least two electrodes to an applied electric field and exposing said materials to an image pattern of radiation to which the material is photosensitive, thereby obtaining image formation on at least one of said elec-

trodes, wherein at least a portion of said material is an electrically photosensitive material having the structure



wherein

Z^1 and Z^2 may be the same or different and each represents the non-metallic atoms necessary to complete a nucleus selected from the group consisting of thiazole, benzothiazole, naphthothiazole, thianaphtheno-7',6',4,5-thiazole, oxazole, benzoxazole, naphthoxazole, selenazole, benzoselenazole, naphthoselenazole, thiazoline, 2-quinoline, 4-quinoline, 1-isoquinoline, 3-isoquinoline, benzimidazole, 3,3-dialkyl-3H-indole, 3,3-dialkylbenzindole, 2-pyridine, thiazoloquinoline and 4-pyridine;

Y represents N or a methine carbon C—G^1;

G^1 and G^2 may be the same or different and each is H, alkyl, or aryl or taken together complete a mononuclear or fused polynuclear carbocyclic ring;

A^1 and A^2, which may be the same or different, each represent alkyl, aryl, carboxy, alkoxycarbonyl, benzofuroyl, aryloxycarbonyl, aralkyl, alkylcarbonyl, cyano, nitro or taken together A^1 and A^2 represent a substituted or unsubstituted nucleus selected from the group consisting of indandione, pyrazolinone, rhodanine; 2(3H)-imidazopyridone; thioxazolidinone, oxazolidinedione; thianaphthenone; 2-thioxothiazolidinone; thiazolidinone; 4-thiazolinone, 4-oxazolinone-2-imine; 2,4-imidazolinedione (hydantoin); thioxoimidazolinone; 5-imidazolinone; 2,4-chromandione; naphthopyrandione; 5-anthraceneone; 1,3-dioxan-4,6-dione; indolinone; indolinethione; isoxazolinone; 1,3-isoquinolinedione, isoxazolinedione, oxobenzothiazinedioxide, pyridinone, chromanone, pyrandione, pyrazolo-s-triazoletetrone, cyclohexanedione, thiazolobenzimidazolone, iminopiperidinedione, piperidinetrione, thiazolopyrimidinedione, thiazolidinedione, pyranopyrimidinetrione, pyrimidinedione, pyrimidinetrione, thioxothiazolopyrimidinedione and thioxopyrimidinedione;

said A^1 and A^2 substituents being selected from the group consisting of aryl, alkyl, cyano, alkoxycarbonyl, dicyanoalkylene, (benzoxazolinylidene)ethylidene, (3,3-dialkylindolylidene)ethylidene, (benzothiazolinylidene)ethylidine, aralkyl, alkylaryl, alkoxyalkyl, alkoxyaryl, aryloxyalkyl, aryloxyaryl, halo, cyanoalkyl, cyanoaryl, hydroxyalkyl, hydroxyaryl, alkoxycarbonyl, haloalkyl, haloaryl, alkoxycarbonylalkyl, alkoxycarboxylaryl, pyridyl, 2-alkylaminoalkyl, carboxyalkyl, carboxyaryl;

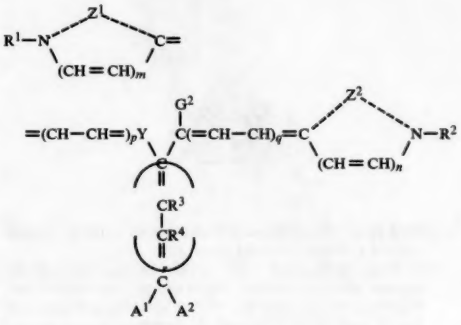
R^1 and R^2, which may be the same or different, represent H, alkyl, aralkyl or aryl;

R^3 and R^4, which may be the same or different, represent hydrogen, alkyl, aryl, cyano, or taken together with the atoms to which they are attached represent a 5 to 6 member carbocyclic ring;

m and n, which may be the same or different, represent 0 or 1;

p, q and r, which may be the same or different, represent 0, 1 or 2.

4. An electrophoretic migration imaging dispersion comprising an electrically insulating carrier, a charge control agent and an electrically photosensitive material having the formula



wherein

Z^1 and Z^2 may be the same or different and each represent the non-metallic atoms necessary to complete a nucleus selected from the group consisting of thiazole, benzothiazole, naphthothiazole, thianaphtheno-7',6',4,5-thiazole, oxazole, benzoxazole, naphthoxazole, selenazole, benzoselenazole, naphthoselenazole, thiazoline, 2-quinoline, 4-quinoline, 1-isoquinoline, 3-isoquinoline, benzimidazole, 3,3-dialkyl-3H-indole, 3,3-dialkylbenzindole, 2-pyridine, thiazoloquinoline and 4-pyridine;

Y represents N or a methine carbon C—G^1;

G^1 and G^2 may be the same or different and each is H, alkyl, or aryl or taken together complete a mononuclear or fused polynuclear carbocyclic ring;

A^1 and A^2, which may be the same or different, each represent alkyl, aryl, carboxy, alkoxycarbonyl, benzofuroyl, aryloxycarbonyl, aralkyl, alkylcarbonyl, cyano, nitro or taken together A^1 and A^2 represent a substituted or unsubstituted nucleus selected from the group consisting of indandione, pyrazolinone, isoxazolinone, rhodanine; 2(3H)-imidazopyridone; thioxazolidinone, oxazolidinedione; thianaphthenone; 2-thioxothiazolidinone; thiazolidinone; 4-thiazolinone, 4-oxazolinone-2-imine; 2,4-imidazolinedione (hydantoin); thioxoimidazolinedione; 5-imidazolinone; 2,4-chromandione; naphthopyrandione; 5-anthraceneone; 1,3-dioxan-4,6-dione; indolinone; indolinethione; 1,3-isoquinolinedione, isoxazolinedione, oxobenzothiazinedioxide, pyridinone, chromanone, pyrandione, pyrazolo-s-triazoletetrone, cyclohexanedione, thiazolobenzimidazolone, iminopiperidinedione, piperidinetrione, thiazolopyrimidinedione, thiazolidinedione, pyranopyrimidinetrione, pyrimidinedione, pyrimidinetrione, thioxothiazolopyrimidinedione and thioxopyrimidinedione;

said A^1 and A^2 substituents being selected from the group consisting of aryl, alkyl, cyano, alkoxycarbonyl, dicyanoalkylene, (benzoxazolinylidene)ethylidene, (3,3-dialkylindolylidene)ethylidene, (benzothiazolinylidene)ethylidine, aralkyl, alkylaryl, alkoxyalkyl, alkoxyaryl, aryloxyalkyl, aryloxyaryl, halo, cyanoalkyl, cyanoaryl, hydroxyalkyl, hydroxyaryl, alkoxycarbonyl, haloalkyl, haloaryl, alkoxycarbonylalkyl, alkoxycarboxylaryl, pyridyl, 2-alkylaminoalkyl, carboxyalkyl, carboxyaryl;

R^1 and R^2, which may be the same or different, represent H, alkyl, aralkyl or aryl;

R^3 and R^4, which may be the same or different, represent hydrogen, alkyl, aryl, cyano, or taken together with the

atoms to which they are attached represent a 5 to 6 member carbocyclic ring;

m and n, which may be the same or different, represent 0 or 1;

p, q and r, which may be the same or different, represent 0, 1 or 2.

4,256,820

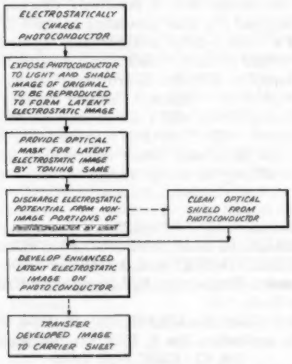
METHOD OF ELECTROPHOTOGRAPHY USING LOW INTENSITY EXPOSIVE

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 908,355, May 22, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,512

Int. Cl.³ G03G *13/22, 13/04*

U.S. Cl. 430—54 **5 Claims**


ELECTROSTATICALLY CHARGE PHOTOCONDUCTOR
EXPOSE PHOTOCONDUCTOR TO LIGHT AND SHADE IMAGE OF ORIGINAL TO BE REPRODUCED TO FORM LATENT ELECTROSTATIC IMAGE
PROVIDE OPTICAL MASK FOR LATENT ELECTROSTATIC IMAGE BY TONING SAME
DISCHARGE ELECTROSTATIC POTENTIAL FROM NON-IMAGE PORTIONS OF PHOTOCONDUCTOR BY LIGHT
CLEAN OPTICAL SHIELD FROM PHOTOCONDUCTOR
DEVELOP ENHANCED LATENT ELECTROSTATIC IMAGE ON PHOTOCONDUCTOR
TRANSFER DEVELOPED IMAGE TO CARRIER SHEET

1. In a method of electrophotography in which a photoconductor is charged in the dark in a charging step, subjected to a light and shade image of a document to be copied to produce a latent electrostatic image of the document on the surface of the photoconductor in an exposing step, the latent electrostatic image is developed to provide a visible image on the photoconductor in a development step and said visible image is then transferred to a carrier sheet, the improvement comprising reducing the duration of the exposing step by a major portion of the time required to form a latent electrostatic image of satisfactory contrast to present a latent electrostatic image having a first contrast, toning said first-contrast electrostatic image with liquid-carried toner to provide an optical shield for the first-contrast latent electrostatic image while preventing deposition of toner on the background areas of the photoconductor, flooding the shielded first-contrast electrostatic image with light to discharge the unshielded areas of the photoconductor whereby to enhance the first-contrast electrostatic image to produce an electrostatic image having a contrast higher than said first contrast, removing the optical shield from the enhanced electrostatic image before practicing said developing step.

4,256,821

ELECTROPHOTOGRAPHIC ELEMENT WITH CARBAZOLE-PHENYHYDRAZONE CHARGE TRANSPORT LAYER

Takamichi Enomoto, Shiroyama; Tatuya Katoh, Numazu; Akio Kozima, Hiratsuka, and Tatsumi Satoh, Musashino, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

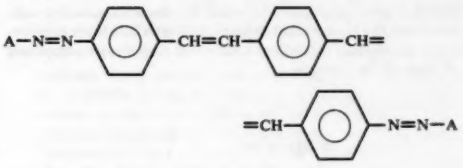
Filed Dec. 12, 1979, Ser. No. 102,591

Claims priority, application Japan, Dec. 21, 1978, 53-158280

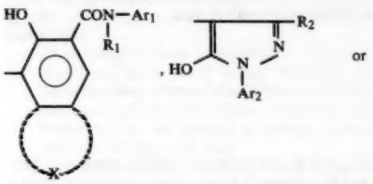
Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—59 **15 Claims**

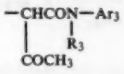
1. A layered electrophotographic element which comprises an electroconductive support on which there is a charge generating layer and a charge transfer layer in order, said charge generating layer consisting essentially of a charge generating agent expressed by the general formula I



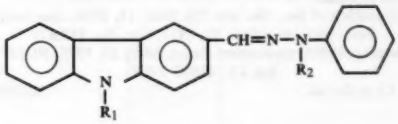
wherein A represents



or



wherein X is selected from the group consisting of benzene ring, naphthalene ring, indole ring, carbazole ring, benzofuran ring and substitutes thereof, Ar_1 is selected from the group consisting of benzene ring, naphthalene ring, dibenzofuran ring, carbazole ring and substitutes thereof, Ar_2 and Ar_3 are selected from the group consisting of benzene ring, naphthalene ring and substitutes thereof, R_1 and R_3 are selected from the group consisting of hydrogen, lower alkyl group, phenyl group and substitutes thereof and R_2 is selected from the group consisting of lower alkyl group, carboxyl group and alkyl esters thereof, said charge transfer layer consisting essentially of a charge transfer agent expressed by the general formula II



wherein R_1 represents methyl, ethyl, 2-hydroxyethyl or 2-chloroethyl group and R_2 represents methyl, ethyl, benzyl or phenyl group and polycarbonate.

4,256,822

ELECTROPHOTOGRAPHIC PLATE CONTAINING QUATERNARY AMMONIUM SALT POLYMER INTERLAYER

Noriyoshi Tarumi; Akihiko Tamura; Masakazu Kokiso, all of Hachioji; Toshio Muramatsu, and Koichi Nagayasu, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 818,311, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,521, Nov. 13, 1975, abandoned. This application Aug. 23, 1979, Ser. No. 69,073

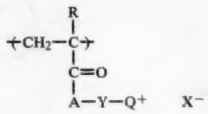
Claims priority, application Japan, Nov. 16, 1974, 49-132432

Int. Cl.³ G03G *5/14*

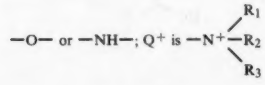
U.S. Cl. 430—62 **6 Claims**

1. A binder-type electrographic photosensitive plate which

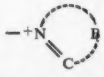
possesses stable electrical and physical properties and which is used to make multiple copies by a transfer process, comprising: an electroconductive substrate which is a metal plate or a plastic film having an electrically conductive layer containing carbon black power thereon, a photosensitive layer and an interface layer positioned between the electroconductive substrate and the photosensitive layer, said interface layer containing as an essential ingredient a mono- or co-polymer comprised of units of the formula:



wherein R is hydrogen or methyl; A is



wherein R_1, R_2, and R_3 are each lower alkyl, phenyl, or benzyl, with R_2 and R_3 optionally being joined together to form a ring, or



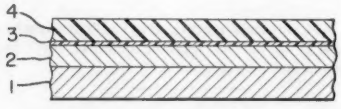
wherein B is a non-metallic atom selected from the group consisting of carbon, nitrogen, and sulfur, necessary to form a 5–6 membered heterocyclic nucleus with the $-N^+=C-$ group; X^- is an anion, and Y is a substituted or unsubstituted alkylene group; and in which the molecular weight of said mono- or co-polymer ranges from 5000–200,000.

4,256,823

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEDIA

Teruomi Takahashi, Yokohama, and Takehiko Matsuo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 666,779, Mar. 16, 1976, abandoned. This application Oct. 19, 1977, Ser. No. 843,679
Claims priority, application Japan, Mar. 20, 1975, 50-33774
Int. Cl.[3] G03G *5/04*
U.S. Cl. 430—66 **8 Claims**



1. An electrophotographic photosensitive member comprising a photoconductive layer composed of a photoconductor dispersed in an electrically insulating binder, a clearcoling layer on said photoconductive layer and consisting essentially of an organic high polymer formed by applying onto said photoconductive layer a dispersion of fine particles of said polymer in a liquid dispersion medium in which said polymer in insoluble, said dispersion medium being incapable of dissolving said insulating binder and being chemically unreactive with said photoconductor, and a smooth-surfaced electrically insulating layer formed on the clearcoling layer and capable of retaining an electrostatic charge, wherein the fine particles of said polymer accumulate on the surface of said photoconductive layer to make a smooth interface between said photoconductive layer and said insulating layer.

4,256,824

METHOD USING POSITIVELY CHARGED ELECTROPHOTOGRAPHIC TONER CONTAINING AMIDO DIALKYL HYDROXY AMMONIUM COMPOUND

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 19,694, Mar. 12, 1979. This application Oct. 1, 1979, Ser. No. 80,606
Int. Cl.[3] G03G *13/09*
U.S. Cl. 430—122 **3 Claims**

1. A method for causing the development of images formed in a xerographic imaging system, which comprises forming a negative electrostatic latent image on a photoreceptor surface, contacting the image with a positively charged developer material comprised of a toner consisting of about 92 percent by weight of a styrene/n-butyl methacrylate copolymer resin, 6 percent by weight of carbon black, and 2 percent by weight of a stearamidopropyl dimethyl hydroxyethyl ammonium dihydrogen phosphate or a stearamidopropyl dimethyl hydroxyethyl ammonium nitrate, and a carrier material consisting of a steel core coated with a polyvinyl fluoride resin, followed by transferring the developed latent image to a substrate and permanently affixing the image thereto by heat.

4,256,825

PHOTOGRAPHIC ELEMENT AND PHOTOGRAPHIC RECORD PREPARED THEREFROM

Frank J. Loprest, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 686,538, May 14, 1976, abandoned. This application Jun. 8, 1979, Ser. No. 46,869
Int. Cl.[3] G03C *1/58, 1/76*
U.S. Cl. 430—142 **4 Claims**

1. A method for producing a radiograph which comprises providing a photographic element, having a photographic base carrying a light-sensitive photographic silver halide emulsion layer and a photosensitive non-silver halide layer in operative association with said silver halide layer, said non-silver halide layer being light-sensitive positive working diazotype composition with form azo dyes and the steps of imagewise exposure of said photographic element to x-ray radiation; development of the element to form a silver image; imagewise exposure of said non-silver halide layer through the silver image; and development of the non-silver halide layer to form a non-silver image corresponding to and in registry with silver image.

4,256,826

BLEACH-FIX SHEETS

Gerhard Popp, Webster; Patrick H. Saturno, and Keith H. Stephen, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,399
Int. Cl.[3] G03C *7/00, 5/32*
U.S. Cl. 430—213 **33 Claims**

13. A photographic film unit containing a silver halide developing agent, said film unit comprising:

(a) an element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

(b) a bleach-fix sheet comprising a support having thereon a single layer or plurality of layers comprising:

(i) a metallic silver bleaching agent,

(ii) a silver salt fixing agent, and

(iii) a hydrophilic binder having a swelling rate T ½ greater than 5 seconds; and

(c) an alkaline processing composition and means for discharging same within said film unit in contact with said photosensitive layer,

wherein, upon discharge of said processing composition, said silver halide is developed imagewise, the developing metallic silver is bleached, and the silver halide is fixed, leaving a dye image.

14. The photographic film unit of claim **13** wherein said dye-bleach sheet contains a mordant for the dye provided by said dye image-providing materials.

4,256,827

PHOTOGRAPHIC ELEMENT FOR COLOR DIFFUSION TRANSFER PROCESS HAVING A NOVEL NEUTRALIZING SYSTEM

Yasuhiro Noguchi; Shinji Sakaguchi, and Takashi Yoshida, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 19, 1979, Ser. No. 31,680

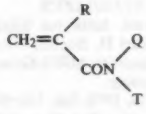
Claims priority, application Japan, Apr. 19, 1978, 53-46246

Int. Cl.[3] **G03C** *1/48, 1/40;* **B32B** *27/08, 27/30*

U.S. Cl. 430—215 **24 Claims**

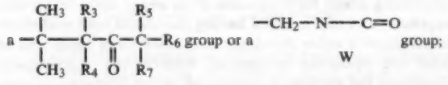
1. In a photographic element for the color diffusion transfer process including a neutralizing system for reducing the pH of an aqueous alkaline developing solution which comprises a support having coated thereon a neutralizing layer and a timing layer, wherein the timing layer is positioned on or under the neutralizing layer in direct or indirect contact therewith such that the aqueous alkaline developing solution reaches the neutralizing layer through the timing layer, the improvement which comprises the timing layer comprising a polymer latex which is produced by emulsion polymerization of each of at least one monomer selected from the group consisting monomers of Group (A), at least one monomer selected from the group consisting of monomers of Group (B) and at least one monomer selected from the group consisting of monomers of Group (C) wherein:

Group (A) monomers are represented by the following formula (I):



(I)

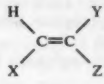
wherein R represents a hydrogen atom or a methyl group; T represents a hydrogen atom or an aliphatic group; Q represents a $—CH_2OCOR_0$ group, a $—CH_2NR_{1a}R_{1b}$ group, a $—CH_2OR_2$ group,



R_0 represent an aliphatic group or an aryl group; R_{1a} and R_{1b}, which may be the same or different, each represents an aliphatic group or R_{1a} and R_{1b} combine to form a ring; R_2 represents a hydrogen atom or an aliphatic group; R_3, R_4, R_5, R_6 an R_7, which may be the same or different, each represents a hydrogen atom or a $—CH_2OR_2$ group provided that all of the R_3 to R_7 do not represent hydrogen atoms at the same time; and W represents an atomic group necessary to form a ring together with the —N—CO— linkage;

Group (B) monomers are polymerizable ethylenically unsaturated monomers having at least one free carboxylic acid group or a free phosphoric acid group or a salt thereof; and

Group (C) monomers are monomers other than those monomers described in Group (A) and Group (B) above which are copolymerizable with the monomers described in Group (A) and Group (B) above wherein the monomer of Group (C) is a monomer represented by the formula (III):



(III)

wherein X represents a hydrogen atom, a methyl group or a $—COOR_9$ group; Y represents a hydrogen atom or a methyl group or a $—(CH_2)_n—COOR_{10}$ group; Z represents an aryl group, a $—COOR_{11}$ group, a cyano group, a halogen atom or a —O—CO—R_{11} group and R_9, R_{10} and R_{11}, may be the same or different and represent an aliphatic group or an aryl group; and n represents an integer of 0 to 3.

13. The photographic element of claim **1**, wherein the photographic element is a laminate integral type film unit which comprises:

a photosensitive sheet comprising an image-receiving element containing silver halide emulsion layer(s) and a photosensitive element coated in turn on a support,

a transparent cover sheet which covers the outermost layer positioned on the support including a neutralizing layer and said timing layer, and

a processing element capable of being spread between said photosensitive element and said cover sheet.

4,256,828

PHOTOCOPOLYMERIZABLE COMPOSITIONS BASED ON EPOXY AND HYDROXYL-CONTAINING ORGANIC MATERIALS

George H. Smith, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 2, 1975, Ser. No. 609,898

Int. Cl.[3] **G03C** *1/68*

U.S. Cl. 430—280 **18 Claims**

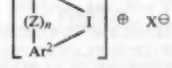
1. A photocopolymerizable composition comprising:

(a) a first organic material having epoxide functionality greater than about 1.5;

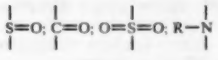
(b) a second organic material having aliphatic hydroxyl functionality of at least 1; said material being free of other active hydrogens and being free of epoxide groups; and

(c) a complex salt photoinitiator selected from the group consisting of:

(i) aromatic iodonium complex salts having the formula



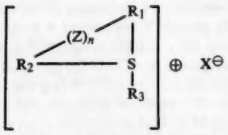
where Ar^1 and Ar^2 are aromatic groups having 4 to 20 carbon atoms and are selected from the group consisting of phenyl, thienyl, furanyl and pyrazolyl groups; Z is selected from the group consisting of oxygen; sulfur;



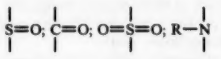
where R is aryl or acyl; a carbon-to-carbon bond; or

where R_1 and R_2 are selected from hydrogen, alkyl radicals of 1 to 4 carbons, and alkenyl radicals of 2 to 4 carbons; and n is zero or 1; and wherein X^- is a halogen-containing complex anion selected from tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, and hexafluoroantimonate; and

(ii) aromatic sulfonium complex salt having the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of aromatic groups having 4 to 20 carbon atoms and alkyl radicals having 1 to 20 carbon atoms; wherein at least one of R_1, R_2 and R_3 is aromatic; wherein Z is selected from the group consisting of oxygen; sulfur;



where R is aryl or acyl; a carbon-to-carbon bond; or

where R_4 and R_5 are selected from the group consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, and an alkenyl radical having 2 to 4 carbon atoms; and n is zero or 1; and X is a halogen-containing complex anion selected from tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, and hexafluoroantimonate;

wherein the ratio of hydroxyl equivalents in said second organic material to epoxide equivalents in said first organic material is in the range of 0.001/1 to 10/1; and wherein said photoinitiator is present in said composition in an amount of about 0.1 to 30 parts by weight per 100 parts by weight of combined first and second organic materials.

4,256,829

METHOD OF MANUFACTURING SOLID-STATE DEVICES IN WHICH PLANAR DIMENSIONAL DISTORTION IS REDUCED

Peter J. Daniel, Dorking, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1978, Ser. No. 902,291

Claims priority, application United Kingdom, May 11, 1977, 19769/77

Int. Cl.³ H01L *21/72*

U.S. Cl. 430—312 **22 Claims**

1. A method of manufacturing a microminiature solid-state device, which comprises:

providing a radiation-sensitive material on a first major surface of a solid-state substrate;

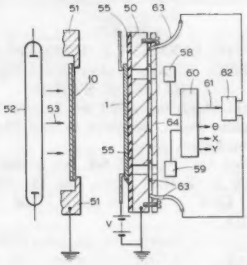
providing a first mask having a first pattern for defining locations on said radiation-sensitive material;

exposing said radiation-sensitive material to radiation through said mask pattern in a first exposure step to define locations for localized processing at said substrate surface while maintaining said mask and said substrate in a substantially planar condition;

then locally processing said substrate to fabricate the device in a process which causes dimensional distortion of siad substrate surface in the plane of the substrate surface;

providing further radiation-sensitive material on said major surface;

adjusting the relative sizes of the area of said substrate surface and the area of said second mask in a substantially uniform manner; and



then exposing said further radiation-sensitive material to radiation in a second exposure step through a second mask pattern in a second mask to define further locations for localized processing at said substrate surface, said relative size adjustment being in such a direction as to reduce the misalignment in the relative locations defined by said first and second exposure steps resulting from said planar dimensional distortion.

4,256,830

PHOTOGRAPHIC MATERIAL CONTAINING A STABILIZER

Gerhard Jäger, Wuppertal; Anita von König, Krefeld; Armin Voigt, Cologne, and Karl H. Büchel, Wuppertal, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

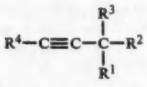
Filed Nov. 16, 1978, Ser. No. 961,217

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2752046

Int. Cl.³ G03C *7/00, 5/30, 1/34, 1/28*

U.S. Cl. 430—372 **9 Claims**

1. Light sensitive color photographic material having at least one silver halide emulsion layer, of improved stability and containing grains for formation of an image upon imagewise exposure, and said material having associated with said silver halide layer a color developer and color compounds and at least one stabilizing compound, wherein the improvement comprises the stabilizing compound of the following general formula or a salt thereof:



in which

R^1 represents a substituted or unsubstituted alkyl, aryl, aralkyl, or heterocyclic group,

R^2 represents a hydroxyl group, or a nitrogen-containing heterocyclic group having 5 or 6 ring atoms.

R^3 represents a substituted or unsubstituted aryl group

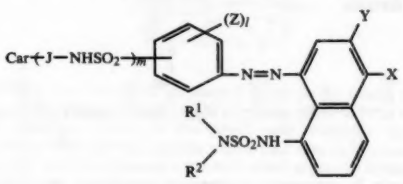
R^4 represents hydrogen, a substituted or unsubstituted alkyl, aryl or dialkylamino alkyl group, a morpholinomethyl group or an N-pyrrolidinyl methyl group, provided that at least one of the groups R^1 and R^2 is a heterocyclic group.

4,256,831
LIGHT-SENSITIVE PHOTOGRAPHIC ELEMENT COMPRISING A MAGENTA IMAGE DYE-PROVIDING COMPOUND

Masaru Kanbe; Kazumasa Watanabe; Morito Uemura; Jiro Takahashi; Ryuichiro Kobayashi, and Tatsuhiko Kobayashi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1979, Ser. No. 68,508
Claims priority, application Japan, Aug. 31, 1978, 53-106463
Int. Cl.³ G03C *1/10, 1/40, 5/54*
U.S. Cl. 430—562 **9 Claims**

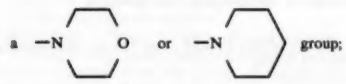
1. A light-sensitive photographic element comprising a support and at least one light-sensitive silver halide emulsion layer coated thereon and having associated therewith a magenta image dye-providing compound represented by formula [I]:



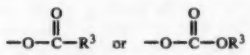
wherein

Car represents a carrier moiety having an organic ballast group which can be oxidized under alkaline conditions to release a diffusible dye or a precursor thereof from said compound;

R^1 and R^2, which may be the same or different, independently represent a hydrogen atom or an alkyl group having 1 to 3 carbon atoms (provided that the total sum of carbon atoms in R^1 and R^2 does not exceed 5), or R^1 and R^2 may form, together with the nitrogen atom,



X represents a hydroxyl group, a salt thereof or a group, which can be converted into a hydroxyl group by hydrolysis, having the following formula:



in which R^3 represents an alkyl or haloalkyl group having 1 to 18 carbon atoms or a phenyl group which may be substituted;

Y represents a

group in which R^4 and R^5, which may be the same or different, independently represent a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or a cycloalkyl group (provided that the total sum of carbon atoms in R^4 and R^5 does not exceed 6);

Z represents a hydrogen atom, a chlorine atom, a methyl group or a methoxy group;

l is 1 or 2 provided that when l is 2 each Z may be the same or different;

m is 0 or 1;

and

J represents a bivalent linking group having the formula $—R^6—(O)_n—R_p^7—$ in which R^6 and R^7, which may be the same or different, independently represent an alkylene group having 1 to 8 carbon atoms, a phenylene group which may be substituted; n represents 0 or 1; p represents 0 or 1 provided that p is 1 when n is 1 and 1 or 0 when n is 0 (provided that, when p is 1, the total sum of carbon atoms in R^6 and R^7 does not exceed 13).

4,256,832
CARCINOGEN AND MUTAGEN SCREENING METHOD AND APPARATUS

Eugene Findl, Amityville, and Anthony M. Cundell, Huntington, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Dec. 12, 1978, Ser. No. 968,695
Int. Cl.³ C12Q *1/68, 1/29*
U.S. Cl. 435—6 **15 Claims**

1. A method of screening a material for potential carcinogenic or mutagenic activity comprising:

(a) providing a mutant strain of eucaryotic or prokaryotic test organism capable of reverting to a normal form in the presence of a carcinogen or mutagen;

(b) providing a growth media in which the test organism is capable of rapid growth in one only of its mutant or normal forms;

(c) combining said mutant strain of test organism and said growth media;

(d) contacting the combined test organism and growth media with a material to be screened in the presence of oxygen;

(e) detecting the consumption of oxygen resulting from step (d) to determine if said mutant strain of test organism has reverted to its normal form to thereby determine if said material to be screened is potentially carcinogenic or mutagenic.

4,256,833
ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS

Majid Ali, 19 Edgemont Pl., Teaneck, N.J. 07666; Donald Nalebuff, 89 Lake Shore Dr., Oakland, N.J. 07436; Alfred Fayemi, 15 Francine Ct., White Plains, N.Y. 10607; Madhava P. Ramanarayanan, 100 Haven Ave., New York, N.Y. 10032, and Ricardo Mesa-Tejada, 42 Juniper Pl., Briarcliff Manor, N.Y. 10510

Filed Jan. 8, 1979, Ser. No. 1,874
Int. Cl.³ C12Q *1/66;* **C12N** *11/02, 9/96*
U.S. Cl. 435—7 **8 Claims**

1. A stable peroxidase immunoglobulin conjugate having an average of 2–3 molecules of peroxidase per molecule of immunoglobulin and an RZ value of 0.5–0.6 by reacting a peroxidase which has been previously treated with phenyl isothiobyanate to block its free amino groups and oxidized to form aldehyde groups from its carbohydrate moiety with an immunoglobulin to form a Shiff's base which is titrated with a reducing agent to form the stable conjugate.

3. In an enzyme immunoassay for detecting IgE antibody specific for allergen, in which a test serum is brought into contact with allergens immobilized on a solid phase under binding conditions and then are enzyme-labelled immunoglobulin is contacted with the specific IgE antibodies bound to the solid phase and thereafter the enzyme activity of the solid phase is determined, the improvement which comprises employing the peroxidase labelled immunoglobulin conjugate of claim 1 as said enzyme labelled immunoglobulin.

4,256,834
FLUORESCENT SCAVENGER PARTICLE IMMUNOASSAY

Robert F. Zuk, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Apr. 9, 1979, Ser. No. 28,640
Int. Cl.[3] C12Q *1/66;* A61K *37/00;* G01N *31/00, 23/00*
U.S. Cl. 435—7 23 Claims

1. A method for determining the presence in a sample of an analyte which is a member of a specific binding pair consisting of ligand and homologous antiligand, employing as reagents: (a) a member of said specific binding pair bound to a discrete dispersible particle to provide a particle conjugate; (b) a member of said specific binding pair conjugated to a member of a signal producing system to provide a signal label conjugate, wherein said signal producing system is capable of emitting ligh upon excitation of a member of said system, and (c) an opaque solid light absorptive signal repressor particle capable of modulating the signal producing capability of said signal label conjugate when bound to said signal label repressor, but inhibited from said modulating, when said signal label conjugate is bound to said particle conjugate;

said method comprising:

(1) combining in an aqueous assay medium, said sample, particle conjugate, signal label conjugate, and signal repressor,

with the proviso that when said member of the specific binding pair is the same for said analyte, particle conjugate and signal label conjugate, the homologous member is added; and

(2) determining at at least one wavelength the light emitted by said signal producing system in said aqueous assay medium.

8. A method according to claim 1, wherein said signal label reacts with an enzyme prior to production of said signal and said enzyme is a member of said signal producing system.

10. A kit for use in a method according to claim 1, for determining a member of a specific binding pair consisting of ligand and antiligand, said kit comprising a particle conjugate consisting essentially of a member of said specific binding pair bound to a discrete dispersible solid particle; a signal label conjugate consisting essentially of a member of a signal producing system capable of emitting light upon excitation of one of its members conjugated to a member of said specific binding pair; and an opaque solid particle capable of repressing the emission of light of said signal label conjugate when said signal label conjugate is bound to said particle, wherein when said signal label conjugate is bound to said particle conjugate through the intermediacy of said specific binding pair, said opaque particle is inhibited from binding to said signal label conjugate and repressing the emission of light of said signal label conjugate.

4,256,835
PROCESS FOR PREPARING CEPHAMYCIN C

Yoshimi Kawamura, Mino; Jun'ichi Shoji, Hirakata, and Kouichi Matsumoto, Toyonaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Feb. 27, 1979, Ser. No. 15,869
Claims priority, application Japan, Mar. 7, 1978, 53/26252
Int. Cl.[3] C12P *35/08*
U.S. Cl. 435—48 2 Claims

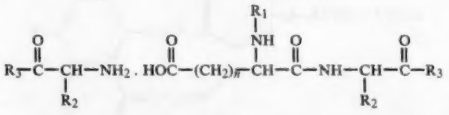
1. A process for producing the antibiotic cephamycin C which comprises cultivating the antibiotic cephamycin C-producing strain of *Streptomyces todorominensis,* ATCC No. 31489 in an aqueous nutrient medium at a temperature of about 20° C. to about 40° C. for about 20 hours to about 100 hours under aerobic or submerged condition and isolating the accumulated antibiotic cephamycin C from the fermentation broth.

4,256,836
ADDITION COMPOUND OF DIPEPTIDE DERIVATIVE AND AMINO ACID DERIVATIVE

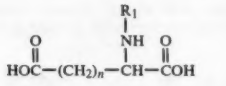
Yoshikazu Isowa; Muneki Ohmori, both of Tokyo; Kaoru Mori; Tetsuya Ichikawa, both of Sagamihara; Yuji Nonaka, Shin-nanyo; Keiichi Kihara, Shin-nanyo; Kiyotaka Oyama, Shin-nanyo; Heijiro Satoh, Shin-nanyo, and Shigeaki Nishimura, Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Tokyo and (Zaidanhojin) Sagami Chemical Research Center, Yamaguchi, both of, Japan

Division of Ser. No. 870,108, Jan. 17, 1978, Pat. No. 4,165,311.
This application Mar. 13, 1979, Ser. No. 20,058
Claims priority, application Japan, Jan. 27, 1977, 52/7279; May 19, 1977, 52/57036
Int. Cl.[3] C07C *103/52;* C12P *21/02*
U.S. Cl. 435—70 21 Claims

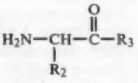
1. A process for producing an addition compound having the formula



wherein R_1 represents an aliphatic oxycarbonyl group, benzyloxycarbonyl group which can have nuclear substituents, or benzoyl, aromatic sulfonyl or aromatic sulfinyl group; R_2 represents methyl, isopropyl, isobutyl, isoamyl or benzyl group; R_3 represents a lower alkoxyl, benzyloxy, benzhydryloxy group and n represents 1 or 2 which comprises reacting an N-substituted monoaminodicarboxylic acid having the formula



with an amino carboxylic acid ester having the formula



in an aqueous medium in the presence of a protease in a pH range wherein the protease exerts enzymatic activity and reacting the resulting dipeptide ester with the amino carboxylic acid ester thereby depositing the addition compound and separating the same.

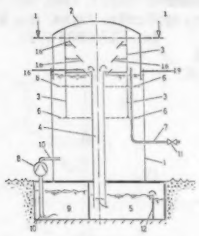
4,256,837
GAS COLLECTION APPARATUS

Peter Fluri, Domat; Richard Voser, Chur, and Peter Wettstein, Domat, all of Switzerland, assignors to Inventa AG für Forschung und Patentverwertung, Zurich, Zurich, Switzerland

Filed Nov. 5, 1979, Ser. No. 91,023
Claims priority, application Switzerland, Nov. 6, 1978, 11382/78; Jul. 5, 1979, 6288/79
Int. Cl.[3] C12P *5/02*
U.S. Cl. 435—167 14 Claims

1. Apparatus for the recovery of gas evolved from fermentation, comprising: a vessel for receiving fermentable material; a head mounted on said vessel to define a substantially gas-tight chamber therebetween, said head being movable toward and away from said vessel; means for discharging the fermentable material from said chamber into a receiver after fermentation of the material; means for introducing the fermentable material into said vessel to a predetermined height therein; and a closable outlet for the gas evolved from fermentation of the mate-

rial, said outlet communicating with the chamber at a location above said predetermined height to which the fermentable material is introduced; said head having at least one projection movable therewith and disposed at least partially in said chamber, and at least a portion of said projection extending below said predetermined height of the fermentable material when



said head is at its closest position relative to the vessel and above said predetermined height when the head is at its furthest position relative to the vessel; said projection being slanted toward said discharging means such that movement of the head toward and away from said vessel urges the fermentable material toward said discharging means.

4,256,838

METHOD OF PURIFICATION OF GLUCOSE ISOMERASE

Denise M. Jackson, Chicago; Yoshihisa Tsuda, Highland Park, and Vida Winans, Downers Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 13, 1979, Ser. No. 93,569

Int. Cl.³ C12N 9/92

U.S. Cl. 435—234 **8 Claims**

1. A process for purifying an enzyme possessing glucose isomerase activity contained within a buffered solution of said enzyme which comprises the steps of:

(a) treating said buffered solution of said enzyme with a nucleic acid precipitation reagent consisting essentially of a reagent selected from the group of streptomycin and water-soluble salts of said streptomycin in a concentration of from about 0.001 to about 1.0 weight-volume percent to precipitate essentially all of the nucleic acids from said buffered solution of said enzyme as a solid and to provide an enzyme solution essentially free of said nucleic acids;

(b) passing said essentially nucleic acid free solution of said enzyme to a chromatographic column possessing chromatographic column packing to remove proteinaceous material from said solution of said enzyme by means of said chromatographic column packing comprising diethylaminoethyl cellulose; and

(c) eluting said enzyme of said solution through said chromatographic packing of step (b) with said buffer of step (a) to produce purified enzymes possessing glucose isomerase activity.

4,256,839

REACTOR SYSTEM SUCH AS A FERMENTATION SYSTEM

Gerald L. Solomons, Radnage, and Geoffrey A. LeGrys, Oxon, both of England, assignors to Ranks Hovis McDougall Limited, London, England

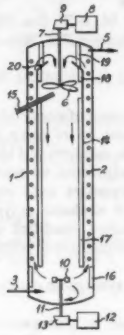
Filed May 31, 1978, Ser. No. 911,125

Claims priority, application United Kingdom, Jun. 1, 1977, 23128/77

Int. Cl.³ C12M 1/08, 1/06

U.S. Cl. 435—314 **5 Claims**

1. An apparatus for effecting mass transfer, said apparatus comprising a vessel which is cylindrical and arranged with its axis vertical, two impellers located in said vessel for rotation about vertical axes generally aligned with the vertical axis of said vessel, one of said impellers being located toward the top of said vessel and the other of said impellers being located toward the bottom of said vessel, one of said impellers being an axial flow impeller to produce a flow along the axis of said vessel and the other of said impellers being a radial flow impeller to produce a radially outward flow therefrom, and said radial flow impeller and said vessel being so related that a structure free annular zone exists between the outer periphery



of said radial flow impeller and the cylindrical wall of said vessel to permit material to flow unimpeded from said radial flow impeller toward said cylindrical wall of said vessel, and a draft tube located within and generally coaxial with said cylindrical vessel, said draft tube being of a uniform diameter throughout substantially all of its length and having an open bottom of said uniform diameter, said lower impeller being said radial flow impeller and being located below said lower end of said draft tube.

4,256,840

MACRORETICULAR CATION EXCHANGE BEADS AND PREPARATION OF SAME

Erich F. Meitzner, Glenside, and James A. Oline, Wyncote, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 749,526, Jul. 18, 1958, Pat. No. Des. 250,972. This application May 21, 1979, Ser. No. 41,166

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.³ C08F 8/30, 8/34, 8/40, 8/46

U.S. Cl. 521—33 **8 Claims**

1. Cation exchange resin beads of macroreticular structure, high surface area, and lowered apparent density crosslinking essentially of a macroreticular crosslinked copolymer matrix with cation exchange functional groups bonded thereto, said resin beads having (1) an apparent density of at least 0.02 density units less than, and (2) a surface area much greater than gel-type ion exchange beads of the same composition, said beads resulting from the presence therein of microscopic channels or voids of much larger dimensions than the micropores of gel-type ion exchange beads of the same composition, and which crosslinked copolymer matrix is prepared by copolymerizing a mixture consisting essentially of (i) a monovinyl carbocyclic aromatic compound or an ester of an acrylic or methacrylic acid, with (ii) a polyethylenically unsaturated monomer selected from the group consisting of a polyvinyl carbocyclic aromatic compound, an ester of a dihydric alcohol and an α-β-ethylenically unsaturated carboxylic acid, diallyl maleate, and divinyl ketone, the copolymerization being conducted while the monomers are dissolved in a phase separating amount of an organic liquid or mixture of organic liquids which is a solvent for said monomers but which is unable to

substantially swell the copolymers resulting from copolymerization.

4,256,841

MANUFACTURE OF LIGHT-STABLE POLYURETHANE INTEGRAL FOAMS

Heinrich Horacek, Ludwigshafen; Ernst Schoen, Neustadt; Erhardt Reich, Damme, and Otto Volkert, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 38,853

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825569

Int. Cl.[3] C08G *18/24, 18/20, 18/75, 18/77*

U.S. Cl. 521—51 6 Claims

1. A process for the manufacture of light-stable polyurethane integral skin foams by reacting a mixture of organic polyisocyanates, polyols, catalysts and blowing agents, with or without assistants and adjuvants, wherein

the organic polyisocyanates used are selected from the group consisting of aliphatic polyisocyanates, cycloaliphatic polyisocyanates, modified aliphatic polyisocyanates, modified cycloaliphatic polyisocyanates and mixtures thereof and

the catalysts used are synergistic catalyst combinations comprising

(A) a strongly basic polyisocyanurate catalyst selected from the group consisting of alkali metal hydroxides, alkali metal alcoholates, alkali metal phenolates, alkali metal salts of weak acids, 1,3,5-tris-(N,N-dialkylaminoalkyl)-s-hexahydrotriazines and mixtures thereof and

(B) dibutyl-tin dilaurate.

4,256,842

HYDROPHILIC SEPARATING CARRIER AND PREPARATION THEREOF

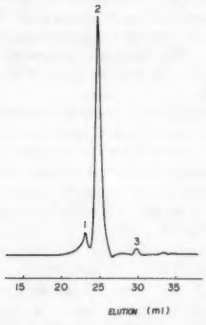
Hiroo Sasaki; Katsuo Komiya, and Yoshio Kato, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Company, Limited, Yamaguchi, Japan

Division of Ser. No. 45,663, Jun. 5, 1979. This application Mar. 7, 1980, Ser. No. 128,130

Claims priority, application Japan, Jun. 8, 1978, 53-68361

Int. Cl.[3] C08J *9/36*

U.S. Cl. 521—53 2 Claims



1. A hydrophilic separating carrier obtained by reacting a hydrophilic oxirane compound or its oligomer by an addition reaction on primary hydroxyl group of a porous spherical gel obtained by an aqueous suspension homopolymerization of pentaerythritol dimethacrylate or an aqueous suspension copolymerization of pentaerythritol dimethacrylate and a methacrylate monomer having hydrophilic group and/or hydrophilic convertible group or a porous spherical gel obtained by hydrolyzing said gel.

4,256,843

HYDROPHILIC SEPARATING CARRIER AND PREPARATION THEREOF

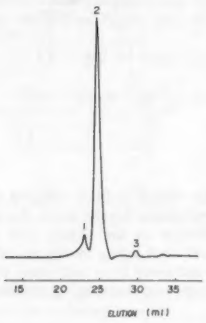
Hiroo Sasaki; Katsuo Komiya, and Yoshio Kato, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Company, Limited, Yamaguchi, Japan

Division of Ser. No. 45,663, Jun. 5, 1979, Pat. No. 4,246,362. This application Mar. 7, 1980, Ser. No. 128,131

Claims priority, application Japan, Jun. 8, 1978, 53/68361

Int. Cl.[3] C08J *9/36*

U.S. Cl. 521—53 2 Claims



1. A hydrophilic separating carrier obtained by hydrolyzing, in an aqueous solution of a base, a porous spherical gel having primary hydroxyl group of the gel obtained by an aqueous suspension homopolymerization of pentaerythritol dimethacrylate or an aqueous suspension copolymerization of pentaerythritol dimethacrylate and a methacrylate monomer having hydrophilic group and/or hydrophilic convertible group.

4,256,844

FIRE RETARDANT, THERMOSETTING, RESINOUS REACTION PRODUCTS OF PHOSPHORIC ACID AND METHYOL- OR ALKOXYMETHYL-SUBSTITUTED EPOXIDES

Patrick H. Martin, Danville; Paul G. Schrader, Antioch, and Robert R. Stringham, Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 753,766, Dec. 23, 1976, abandoned. This application Jun. 7, 1979, Ser. No. 46,290

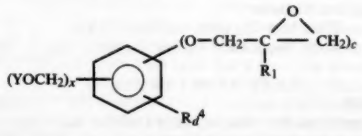
Int. Cl.[3] C08G *59/14, 8/28*

U.S. Cl. 521—59 30 Claims

1. The method of preparing a heat-curable, flame retardant resin which comprises:

contacting a methylol- or alkoxymethyl-substituted epoxide, as defined below, with orthophosphoric acid (H_3PO_4) mixed with 0 to 4 molecular proportions of water per molecular proportion of H_3PO_4, the amount of acid being such as to provide at least 0.7 P—OH hydroxyls per oxirane group, until essentially all of the oxirane groups originally present in said epoxide have been converted to glycol or phosphoester groups,

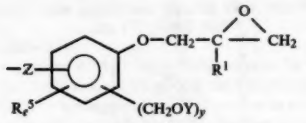
said epoxide consisting essentially of molecules, each of which, independently, is of the formula



(a)

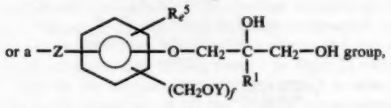
wherein Y is H or a C_1 to C_4 alkyl or C_2–C_4 alkenyl group,

each $YOCH_2$— group is either ortho or para to a glycidyloxy group,
x is 1, 2 or 3, c is 1 or 2 and d is 0 or 1;
R^1, independently in each occurrence, is H, methyl or ethyl;
R^4 is Br, Cl, a C_1–C_{12} alkyl, alkenyl, cycloalkyl, phenyl, alkylphenyl, phenalkyl or phenoxy group, a



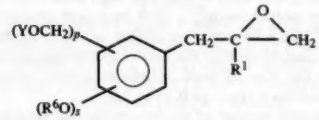
group

or a

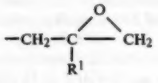


wherein, independently, in each of the latter two groups, Z is $>C(CF_3)_2$, $—SO_2—$, —S—, —O—, or a valence bond,
R^1 is —H, $—CH_3$ or $—C_2H_5$,
R^5 is a C_1 to C_{12} alkyl, alkenyl, cycloalkyl, phenyl, alkylphenyl, phenoxy, —Br or —Cl group,
y and f are each 0, 1 or 2 and e is 0 or 1;
and
(x+f) is not greater than 4 and
(x+y) is 2, 3 or 4;

(b)

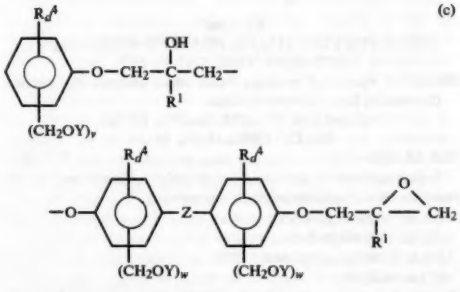


wherein s is 0 or 1 and p is 1, 2 or 3;
R^6 is a C_1 to C_{12} alkyl or a



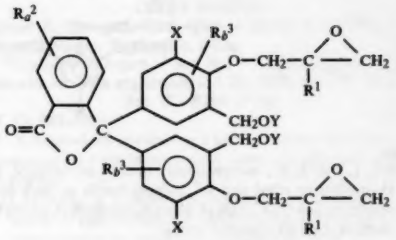
group,
and R^1 and Y are defined as in formula (a),

(c)



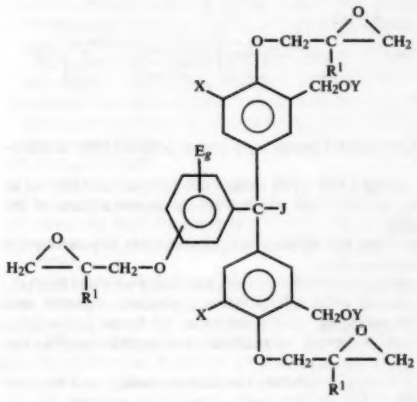
wherein Y, R^1, R^4, d and Z are as defined as in formula (a), v is 1, 2 or 3 and w, independently in each occurrence, is 0, 1 or 2,

(d)



wherein, independently, in each occurrence
R^1 is H, methyl or ethyl,
X is H, $—CH_2OY$, —Br, Cl or a C_1–C_4 alkyl or alkenyl group,
R^2 is —Br or —Cl,
R^3 is methyl or ethyl,
Y is H or a C_1–C_4 alkyl or alkenyl group,
a is 0, 1, 2, 3 or 4 and b is 0 or 1,

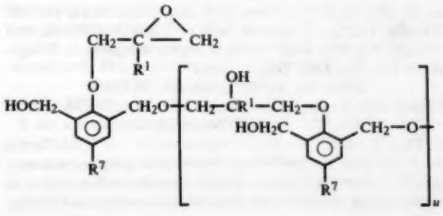
(e)



wherein,
J is H or a C_1–C_{10} alkyl or alkenyl group,
Y is H or a C_1–C_4 alkyl or alkenyl group,
R^1 is H, methyl or ethyl
X is H, $—CH_2OY$, —Br, —Cl or a C_1–C_4 alkyl or alkenyl group, independently in each occurrence,
E is $—CH_2OY$, —Br, —Cl or a C_1–C_4 alkyl group, independently in each occurrence, and
g is 0, 1 or 2,

or

(f) methylol substituted, oligomeric monoepoxides of the formula



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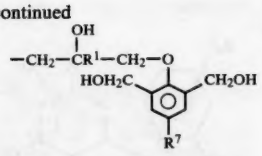


wherein

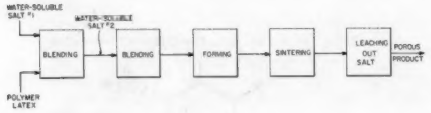
u is 0, 1, 2 or 3, R^1, independently in each occurrence, is H, methyl or ethyl and R^7, independently in each occurrence, is a C_1–C_{12} alkyl, alkenyl, cycloalkyl, phenyl, phenalkyl or alkylphenyl group.

4,256,845

POROUS SHEETS AND METHOD OF MANUFACTURE

Harold B. Morris, Newnan, and Donald G. Bright, College Park, both of Ga., assignors to Glasrock Products, Inc., Fairburn, Ga.

Filed Feb. 15, 1979, Ser. No. 12,433
Int. Cl.³ B29D *27/00*
U.S. Cl. 521—61 **13 Claims**



1. A process for producing a porous polymer sheet comprising:

(a) adding a first water soluble salt to a polymer latex in an amount sufficient to passivate the aqueous phase of the latex;

(b) heating and agitating the polymer latex to passivate the aqueous phase;

(c) adding to the polymer latex passivated with said first salt, a second water soluble salt of a preselected particle size corresponding to the desired pore size for the end-product polymer sheet and in an amount preselected to provide the desired porosity;

(d) heating and agitating the latex containing said first salt and said second salt until a continuous, coherent dough-like material forms;

(e) mechanically working the polymer material obtained in step (d);

(f) forming the material into a sheet of the desired thickness;

(g) drying and then curing or sintering the sheet;

(h) extracting said first and second salts from the cured or sintered sheet with solvent; and

(i) drying the extracted sheet to obtain the porous product.

12. The process of claim 1 wherein said polymer latex is a PTFE latex.

4,256,846

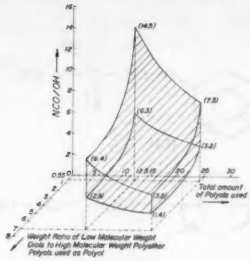
METHOD OF PRODUCING FLAMEPROOF POLYISOCYANURATE FOAMS

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Hiroshi Kaneda; Yoshiko Taniguchi, both of Higashimurayama, and Masako Yoshida, Kodaira, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,430
Claims priority, application Japan, Nov. 10, 1978, 53/137785
Int. Cl.³ C08G *18/14, 18/20, 18/65*
U.S. Cl. 521—117 **12 Claims**

1. A method of producing flameproof polyisocyanurate foams by reacting an organic polyisocyanate with a polyol in the presence of an isocyanate trimerization catalyst, a blowing agent and other additives to form an urethane modified polyisocyanurate foam, which comprises:

(1) using, as said polyol, at least one low molecular weight diol selected from the group consisting of (a) compounds having the general formula



$$HO—(CH_2CH_2O)_nH,$$

wherein n is 2, 3 or 4, (b) compounds having the general formula

$$HO\text{-}\left(CH_2CHO\right)_n\text{-}H,$$
$$\quad\quad\quad

4,256,848

SYNERGISTIC POLYURETHANE CO-CATALYSTS WHICH ARE A COMBINATION OF AN ORGANO-MERCURIC COMPOUND AND A ZINC SALT OF AN ALKYL CARBOXYLIC ACID

Bernardas Brizgys, Southgate, and James A. Gallagher, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 883,376, Mar. 8, 1978, abandoned. This application Oct. 15, 1979, Ser. No. 84,945

Int. Cl.³ C08G 18/14

U.S. Cl. 521—124 22 Claims

1. In a process of forming a polyurethane by reacting an organic polyisocyanate with an organic compound containing at least 2 active hydrogen-containing groups as determined by the Zerewitinoff method, the improvement comprising employing a catalyst consisting of a synergistic combination of at least one organo-mercuric compound and at least one zinc salt of an alkyl carboxylic acid having about 2 to about 22 carbon atoms wherein the organo-mercuric compound is selected from the group consisting of (1) the divalent mono-mercury salts of organic acids and (2) the ionizable mono-organo-mono-mercuric carboxylates or polycarboxylates containing only one carbon to mercury bond which are inert to isocyanate-active hydrogen reactions.

4,256,849

PROCESS FOR THE PRODUCTION OF COLD SETTING FOAMS WHICH CONTAIN URETHANE GROUPS PREPARED FROM A MIXTURE OF 4,4-DIPHENYL METHANE DIISOCYANATE AND 2,4-DIPHENYL METHANE DIISOCYANATE

Jürgen Ick, Coraopolis, Pa.; Hans J. Meiners; Günter Oertel, both of Leverkusen; Günter Hauptmann, Odenthal, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 972,615, Dec. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 843,921, Oct. 20, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,636

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647482; Apr. 21, 1977, 2717653

Int. Cl.³ C08G 18/18, 18/20

U.S. Cl. 521—129 3 Claims

1. In a process for the production of molded cold setting, flexible foams, having a cellular structure on the surface thereof, which foams contain urethane groups by the reaction in a mold of polyethers with a molecular weight of 400 to 10,000 which contain at least two hydroxyl groups and in which at least 10% by weight of the hydroxyl groups are primary hydroxyl groups, mixed with a mixture of diphenyl methane diisocyanates and oligomeric polyphenylpolymethylene polyisocyanates in the presence of blowing agents and in the presence of one or more amine catalysts and optionally other catalysts and foaming aids, the improvement wherein the mixture of diphenyl methane diisocyanates and polyphenyl-polymethylene polyisocyanates is substantially free of carbodiimide groups, has an isocyanate content greater than 30%, and contains from 60 to 90% by weight of 4,4′ diphenyl methane diisocyanate and from 3 to 30% by weight of 2,4′ diphenyl methane diisocyanate wherein the reaction is carried out in the absence of foam stabilizers and wherein the amine catalysts are selected from the group consisting of 1,4 diazabicyclo-2,2,2-octane, 2,2′dimethylamino diethyl ether, tetramethyl ethylene diamine, and N-methyl morpholine.

4,256,850

ARTICLE AND PROCESS SIMULATING PLANTATION CREPE RUBBER

Agmund K. Thorsrud, Stow, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 943,825, Sep. 19, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 61,625

Int. Cl.³ B29D 27/00

U.S. Cl. 521—139 11 Claims

1. A method for producing a molded article simulating the appearance of natural plantation crepe rubber, said method comprising:

(1) blending a composition comprising styrene/butadiene linear or radial block copolymer elastomer having a polymerized styrene content in the range of about 20 to about 50 weight percent of total block copolymer and resinous polymer of vinyl substituted aromatic compound in the range of about 10 to about 60 parts resinous polymer per 100 parts block copolymer elastomer with a sufficient amount of polarizing agent to permit rapid heating using energy at microwave frequencies said polarizing agent chosen from the group consisting of simple and polymeric alkylene glycols and their mono- and dialkyl ethers, ethanolamines and isopropanolamines and their hydrocarbyl-substituted derivatives, liquid acrylonitrile butadiene polymers, acrylonitrile butadiene blends with homopolymers of polyvinyl chloride, styrene acrylonitrile copolymer, glyceryl diacetae, di(2-hydroxyethyl)-5,5-dimethylhydantoin, styrene acrylonitrile resin, and normally solid resinous ethylene-vinyl acetate copolymers;

(2) introducing said composition into a mold that has at least one molding surface that mirrors the appearance of plantation crepe rubber;

(3) closing the mold;

(4) melting said composition using microwave energy;

(5) subjecting said composition to molding conditions;

(6) removing from the mold an object having at least one surface with the appearance of natural plantation crepe rubber.

2. A method of claim 1 wherein said compositon also comprises blowing agent dispersed throughout the composition said blowing agent activated by the elevated temperature during the molding process said composition with blowing agent being introduced into the mold in an amount such that the expansion of the composition as gas is produced from the activated blowing agent results in a microporous structure within a skin of normally dense polymer.

11. A molded article simulating the appearance of natural plantation crepe rubber produced by the method of claim 2.

4,256,851

DEGRADABLE PLASTIC COMPOSITION CONTAINING UNSATURATED ALCOHOL OR ESTER THEREOF

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

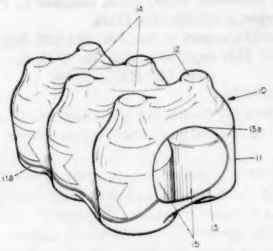
Continuation-in-part of Ser. No. 865,046, Dec. 12, 1977, which is a continuation of Ser. No. 731,486, Oct. 12, 1976, abandoned, which is a continuation of Ser. No. 288,750, Sep. 13, 1972, abandoned. This application Jan. 19, 1978, Ser. No. 870,690

Int. Cl.³ C08J 9/04; C08K 5/05, 5/10

U.S. Cl. 525—1 35 Claims

1. As a composition of matter, an environmentally degradable plastic composition comprising an admixture of a polyolefin and at least one ethylenically unsaturated alcohol or ethylenically unsaturated ester thereof as a readily autoxidizable organic substance substantially uniformly dispersed through-

out said polyolefin, said ethylenically unsaturated alcohol or ester being selected from the group consisting of aliphatic



alcohols, cycloaliphatic alcohols, heterocyclic alcohols and esters thereof.

4,256,852

BINDER COMPOSITION FOR MAGNETIC RECORDING TAPE

Tunehide Naruse, and Ikuo Matsumoto, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 7, 1979, Ser. No. 10,264

Claims priority, application Japan, Feb. 10, 1978, 53/14773

Int. Cl.[3] C08K *3/28, 3/16;* **C08G** *18/04, 18/02*

U.S. Cl. 525—6 **3 Claims**

1. A binder composition for magnetic recording tape which ensures excellent mechanical strengths and causes little or no cupping or curling of the tape, said binder composition consisting essentially of (a) a major proportion of a vinyl chloride-vinyl acetate copolymer having a degree of polymerization of 300 to 500 and a vinyl acetate content of 3 wt.% to 15 wt.%; (b) a polyisocyanate in an amount of 5 to 80% by weight of the copolymer; and (c) a third component resin in an amount ranging from 0 up to 50 wt.% based on the total amount of said copolymer and said third component resin;

said copolymer and said third component resin being non-reactive with the polyisocyanate whereby only the polyisocyanate takes part in a crosslinking reaction in which the isocyanate groups of the polyisocyanate react with moisture in air.

4,256,853

NONLAMINATING POLYPHENYLENE ETHER BLENDS

Floyd E. Naylor, and Roy F. Wright, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 11, 1979, Ser. No. 74,275

Int. Cl.[3] C08L *25/10, 53/02, 71/04*

U.S. Cl. 525—92 **15 Claims**

1. A composition comprising

(a) a polyphenylene oxide

(b) a block copolymer having a number average molecular weight in the range of about 70,000 to about 150,000 and having the formula (A—B—)$_n$Y or A—B—A, wherein

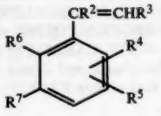
A is a block of polymerized monovinylarene having a heterogeneity index of at least 0.1 unit higher than the heterogeneity index of the block copolymer,

B is a hydrogenated polymer block of polymerized or copolymerized conjugated diene, said block B rendering the block copolymer rubbery;

Y is a radical from a multifunctional coupling agent

n is a number of two or more and

(c) a monovinylarene resin in which at least 25 weight percent of the polymer units are derived from the compound having the formula



wherein R^2 and R^3 are selected from the group consisting of hydrogen and lower alkyl or alkenyl groups of from 1 to 6 carbon atoms; R^4 and R^5 are selected from the group consisting of chloro, bromo, hydrogen, and lower alkyl groups of from 1 to 6 carbon atoms; and R^6 and R^7 are selected from the group consisting of hydrogen and lower alkyl and alkenyl groups of from 1 to 6 carbon atoms or R^6 and R^7 may be concatenated together with hydrocarbyl groups to form a naphthyl group.

4,256,854

POLYMERIZATION OF VINYLIC MONOMER IN PRESENCE OF BENZOTHIAZOL-HYDRAZONES

Edgar Fischer, Frankfurt am Main; Johannes Brandrup, Wiesbaden, and Jürgen Weinlich, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,525

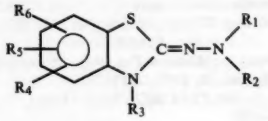
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757924

The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.

Int. Cl.[3] C08F *2/00, 14/06;* **C08L** *27/06*

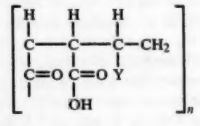
U.S. Cl. 525—242 **5 Claims**

1. A process for the manufacture of vinyl chloride homopolymers, copolymers or graft polymers containing at least 50% by weight of polymerized vinyl chloride units by polymerization of the monomer or the monomer mixture in aqueous dispersion in the presence of radical-forming catalysts which comprises carrying out the polymerization in a reactor the inner walls of which and the other parts where polymer deposits may form are coated at least partially with a coating containing a compound of the formula



in which

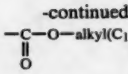
R_1 is hydrogen, with the proviso that at least one of the radicals R_4 to R_6 must be carboxyl or sulfonic ($—SO_3H$), and none of the remaining radicals is hydrogen, or none of the radicals R_4 to R_6 is hydrogen, formyl, $—(CH_2)_x—COOH$ (x=1, 2) or



wherein n=5 to 1000,

Y = phenyl; —O—alkyl(C_1–C_{10}); —O—C(=O)—alkyl(C_1–C_{10}); —CH_2—O—C(=O)—CH_3; or

-continued



R_2 is hydrogen;

R_3 is hydrogen or an aliphatic hydrocarbon radical having from 1 to 12 carbon atoms;

R_4 is R_3; or an O-hydrocarbon radical having from 1 to 12 carbon atoms, hydroxyl, halogen, amino, (di)-alkylamino having from 1 to 12 carbon atoms, carboxyl, or sulfonic;

R_5 and R_6 are defined as in R_4, or

R_4 and R_5 together are an aromatic ring.

4,256,855

METAL SALT COMPLEXES OF VINYL-SUBSTITUTED CYCLIC POLYETHER ADDITION POLYMERS

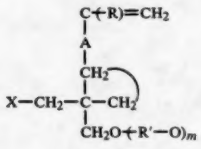
Thomas A. Chamberlin, and Donald A. Tomalia, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 751,870, Dec. 17, 1976, Pat. No. 4,139,539, which is a continuation-in-part of Ser. No. 517,703, Oct. 24, 1974, abandoned. This application Nov. 16, 1978, Ser. No. 961,159

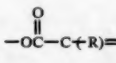
Int. Cl.[3] C08F *20/06, 24/00*

U.S. Cl. 525—326 1 Claim

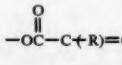
1. A complex comprising an alkali metal salt and a cross-linked, water-insoluble addition polymer of the compound represented by the formula



wherein m is an integer from 2 to about 10, —X is —Cl, —OR″ or —(ACR)═CH_2; —R is hydrogen or methyl; —R—′ is ethylene, 1,2-propylene or 1,3-propylene; —R″ is hydrogen or lower hydrocarbyl; and —AC—R)═CH_2 is selected from the group consisting of —O—C—(R)═CH_2 and



provided that when —X is —Cl, —AC—(R)═CH_2 is



and further characterized in that when the cross-linked water-insoluble addition polymer is a homopolymer of the compound or a copolymer of the compound with a comonomer of monoethylene functionality, then —X is —AC—(R)═CH_2; and when the cross-linked, water-insoluble addition polymer is a copolymer of the compound with a comonomer of multiple ethylene functionality then —X is —Cl, —OR″ or —AC—(R)═CH_2.

4,256,856

COMPONENTS OF URANIUM ENRICHMENT PLANT

Masayuki Ito; Giro Okamoto; Sueo Machi, all of Takasaki, and Kenzo Shirayama, Niihama, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Sugimoto Chemical Co. Ltd., Osaka, both of, Japan

Filed Aug. 15, 1977, Ser. No. 825,539

Claims priority, application Japan, Aug. 20, 1976, 51-99372

Int. Cl.[3] C08F *8/00, 210/02, 214/28*

U.S. Cl. 525—331 18 Claims

1. In a uranium enrichment plant containing a component of a device, the improvement wherein said component is formed of a cross-linked elastic copolymer of ethylene and hexafluoropropylene prepared by cross-linking a copolymer of ethylene and hexafluoropropylene containing 10 to 50% by mole of hexafluoropropylene and having a melt index before cross-linking in the range of 1 to 300 determined at a load of 2.16 kg.

4,256,857

HALOBUTYL OF IMPROVED GREEN STRENGTH

Ernest J. Buckler, Sarnia, and George Feniak, Wyoming, both of Canada, assignors to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 842,119, Oct. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 494,302, Aug. 2, 1974, abandoned. This application May 9, 1979, Ser. No. 37,371

Claims priority, application Canada, Nov. 8, 1973, 185311

Int. Cl.[3] C08F *8/30*

U.S. Cl. 525—331 5 Claims

1. A process of preparing bromobutyl rubber compositions of improved green strength which process comprises reacting bromobutyl rubber with a tertiary amine selected from N,N-dimethyl hexylamine, N,N-dimethyl dodecylamine, N,N-dimethyl octadecylamine, N,N-dimethyl decylamine and N,N-dimethyl benzylamine, the amount of said amine being from about 1/100th to about 1/12th of a chemical equivalent of amine per chemical equivalent of bromine in the bromobutyl rubber, the reaction being at a temperature of from about 25° C. to about 150° C. for a time of from 1 hour to about 48 hours.

4,256,858

PROCESS FOR CROSS-LINKING POLYMERS CONTAINING ACTIVE HALOGEN

Sigurd Behr, Monheim, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Fed. Rep. of Germany

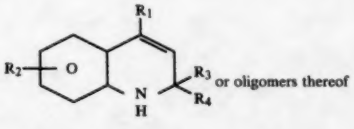
Filed Jul. 25, 1979, Ser. No. 60,831

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832910

Int. Cl.[3] C08F *8/30*

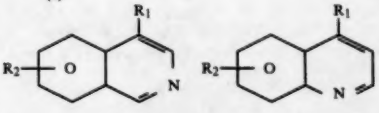
U.S. Cl. 525—375 6 Claims

1. A process for crosslinking polychloroprene by adding crosslinking agents, characterised in that the crosslinking agents used are compounds corresponding to the formulae:



or oligomers thereof

(1)



(2) (2a)

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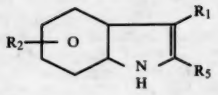
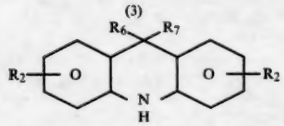
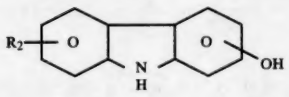


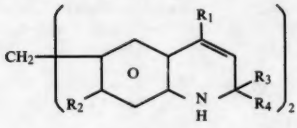
(3)



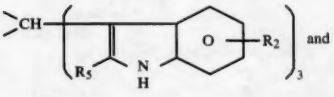
(4)



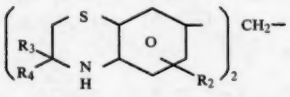
(5)



(6)



(7)



(8)

wherein

R_1 represents hydrogen or C_1–C_4 alkyl;

R_2 represents hydrogen C_1–C_{14} alkyl, C_1–C_{14} alkoxy, C_1–C_{14} alkyl phenyl, phenyl, naphthyl, hydroxyl or C_1–C_{14} alkyl hydroxyl;

R_3 and R_4, which may be the same or different, each represents hydrogen or C_1–C_4 alkyl;

R_5 represents hydrogen or C_1–C_4 alkyl; and

R_6 and R_7 which may be the same or different, each represents hydrogen or C_1–C_4 alkyl;

and in that crosslinking is carried out in the conventional way.

4,256,859

SUBSTITUTED CROWN POLYETHERS

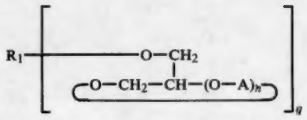
Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1979, Ser. No. 24,625

Int. Cl.³ C08F *8/00*

U.S. Cl. 525—384 **13 Claims**

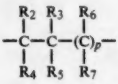
1. A substituted crown polyether of the formula



wherein

(1) R_1 is a polymeric radical selected from reactive halogen containing polymers, homopolymers of acrylates, and copolymers containing acrylate functionality;

(2) A is an alkylene group represented by the formula



wherein p is zero or 1, R_2 to R_7 are each occurrence independently hydrogen or radicals having up to 15 carbons taken from a group consisting of alkyl, aryl and arylalkyl;

(3) n is 3, 4, 5 or 6; and

(4) q is an integer greater than or equal to one.

4,256,860

COPOLYETHERESTERS

Burns Davis; Robert B. Barbee, and Harry R. Musser, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,963

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—437 **10 Claims**

1. A copolyetherester having an inherent viscosity of from 1.0 to about 2.5 comprising

A. a dicarboxylic acid component consisting essentially of 1,4-cyclohexanedicarboxylic acid, and

B. a diol component comprising

(1) at least 70 mole percent 1,4-cyclohexanedimethanol, and

(2) from about 15 to about 60 weight percent, based on the weight of the polyetherester, of polypropyleneether glycol having a molecular weight of 1000 to 4000.

4,256,861

PROCESS FOR PRODUCING POLYETHERESTER ELASTOMER

Burns Davis, and Robert B. Barbee, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,964

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—437 **5 Claims**

1. Method for producing a relatively high molecular weight copolyester which comprises the steps of

(a) melt-phase copolymerizing to an inherent viscosity of about 0.50 to about 1.10 a dibasic acid component and a glycol component, said dibasic acid component consisting essentially of 1,4-cyclohexanedicarboxylic acid having a transisomer content of at least 70% and said glycol component comprising, based on 100 mol percent glycol, from about 97 to about 70 mol percent 1,4-cyclohexanedimethanol, about 3 to about 30 mol percent of a glycol having 2 to 5 carbon atoms and from about 15 to about 80 weight percent of the total polymer of a polyalkyleneether glycol having a carbon to oxygen atom ratio of from 2 to 1 to 4 to 1 and a molecular weight of from about 400 to about 4000,

(b) solid-phase polymerizing in particle form the copolyester from step (a) at a temperature of from about 110° C. to about 170° C. to a higher inherent viscosity of from about

0.60 to about 2.50, said higher inherent viscosity being at least 0.10 higher than the inherent viscosity reached in step (a).

4,256,862

POLYARYL-SULPHONES CONTAINING AN AMMONIUM OR METAL SALT OF AN ORGANIC SULPHONIC ACID

Rudolf Binsack, Krefeld; Joachim Wank, and Eckart Reese, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,113

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810462

Int. Cl.³ C08F *283/00;* C08G *75/23*

U.S. Cl. 525—534 **9 Claims**

1. A modified polyaryl-sulphone comprising one or more polyaryl-sulphones and one or more ammonium salts or metal salts of organic monomeric sulphonic acids, said polyaryl-sulphone having the unit formula

$$(Ar—SO_2—Ar—Z—)_p$$

wherein Ar is a mononuclear, dinuclear, trinuclear or tetranuclear radical in which the nucleus is bonded by fusion, a single bond or a bridge member, —Z— is a single bond, $—SO_2—$ or another bridge member and p is the degree of polymerization giving a weight average molecular weight of between about 10,000 and 60,000.

4,256,863

VINYL HALIDE POLYMERIZATION PROCESS, REACTOR THEREFOR AND COATING PRODUCT FOR USE IN PROCESS AND WITH REACTOR

Malcolm P. McOnie, St. Albans, and Philip D. Roberts, Harpenden, both of England, assignors to Imperial Chemical Industries Limited, London, England

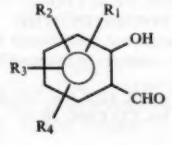
Filed Feb. 12, 1979, Ser. No. 11,664

Claims priority, application United Kingdom, Feb. 24, 1978, 7462/78

Int. Cl.³ C08F *2/00, 2/20*

U.S. Cl. 526—62 **7 Claims**

1. In a process for the polymerisation of vinyl chloride in aqueous dispersion wherein polymerisation is carried out in a reactor having adherently deposited on internal surfaces thereof a coating of a reaction product comprising the reactive admixture of a least polyethyleneimine and one or more of hydroquinone, p-benzoquinone, catechol and o-benzoquinone, the improvement wherein at least one o-aldehyde-substituted phenol of formula



where R1, R2, R3 and R4 which may be the same or different are selected from H, halogen, hydroxyl, alkoxyl, unsubstituted aryl, unsubstituted alkyl, unsubstituted alkenyl, carboxyl, esterified carboxyl and acyl, or the phenate derived therefrom, is included in the reactive admixture to form said product.

4,256,864

POLYMERIZATION REACTORS COATED WITH POLYMER-INHIBITOR COMPLEXES

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 66,151, Aug. 13, 1979, which is a continuation of Ser. No. 929,873, Jul. 31, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 99,357

Int. Cl.³ C08F *3/30, 1/11, 1/88*

U.S. Cl. 526—62 **18 Claims**

1. A process for substantially eliminating the buildup of polymer on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces an aqueous coating solution containing a non-cross-linking hydrophilic polymer water-soluble inhibitor complex, rinsing and coating with water, and conducting the polymerization of the monomer(s) in constant contact with the coated internal surfaces of said vessel.

4,256,865

POLYMERIZATION CATALYST

David L. Hyde, East Pleen, and Kenneth C. Kirkwood, Larbert, both of Scotland, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 849,541, Nov. 3, 1977, abandoned, which is a division of Ser. No. 706,759, Jul. 19, 1976, Pat. No. 4,087,380. This application Mar. 23, 1979, Ser. No. 22,855

Claims priority, application United Kingdom, Jul. 30, 1975, 3189/75

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—124 **6 Claims**

1. A process for polymerizing ethylene or mixtures of ethylene with up to 40%, based on total weight of monomer, of comonomer 1-olefins comprising contacting the monomeric material under polymerization conditions with a supported Ziegler catalyst component in the presence of a Ziegler catalyst activator, said catalyst component being formed by reacting a transition metal compound which is a chloride, chloroalkoxide or oxychloride of titanium, vanadium, or zirconium with an aliphatic alcohol containing 1–6 carbon atoms and impregnating a magnesium oxide support material having an hydroxyl content less than 0.2 OH groups per magnesium atom with the crude product of said reaction, said reaction and impregnation to form the catalyst component being carried out under substantially anhydrous conditions.

4,256,866

POLYMERIZATION PROCESS

Nicholas M. Karayannis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 16, 1976, Ser. No. 696,811

Int. Cl.³ C08F *4/66, 10/06*

U.S. Cl. 526—142 **4 Claims**

1. In a process to polymerize alpha-olefins to a normally-solid, substantially crystalline polymer utilizing a catalyst comprising a transition metal halide and an aluminum alkyl, the improvement comprising adding to such catalyst an effective amount of isochroman, whereby the amount of n-hexane soluble polymeric product is decreased.

4,256,867

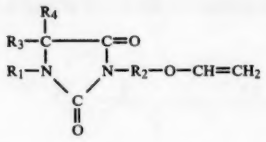
NOVEL VINYL ETHERS, PROCESS FOR THEIR PREPARATION, AND THEIR USE FOR THE PREPARATION OF POLYMERS

Sameer H. Eldin, Birsfelden, and Friedrich Stockinger, Hölstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 920,301, Jun. 29, 1978, Pat. No. 4,206,309.
This application Sep. 4, 1979, Ser. No. 72,493
Claims priority, application Switzerland, Jul. 7, 1977, 8433/77
Int. Cl.[3] C08F 26/06
U.S. Cl. 526—263 10 Claims

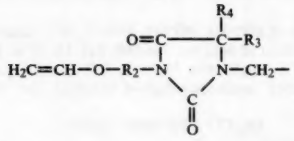
1. An addition polymer which consists essentially of

(a) from 0.005 to 100 mol percent of repeating units derived from a hydantoin vinyl ether of the formula I



(I)

in which R_1 is hydrogen, phenyl, methyl, cyanoethyl, glycidyl, hydroxymethyl, hydroxyethyl, hydroxypropyl, acetyl, 2-hydroxy-2-phenyl-ether or



R_2 is an alkylene group having 1 to 6 carbon atoms or the (-alkylene-O-)n-alkylene- group, in which the alkylene groups contain 1 to 6 carbon atoms and n is a number from 1 to 6, and R_3 and R_4 independently of one another are each hydrogen, an alkyl group having 1 to 6 carbon atoms, or together are a tetramethylene or pentamethylene group, and

(b) from 99.995 to 0 mol percent of repeating units derived from one or two monomers selected from the group consisting of vinyl acetate, acrylonitrile, vinyl ethers, diketene, anhydrides of α,β-unsaturated dicarboxylic acids and styrene.

4,256,868

EPOXY RESINS CONTAINING CHEMICALLY BONDED METAL ATOMS

William L. Tarasen, Lakewood, Calif., assignor to Hitco, Irving, Calif.

Filed Dec. 12, 1979, Ser. No. 102,639
Int. Cl.[3] C08G 59/02, 59/14, 59/30
U.S. Cl. 528—9 4 Claims

1. The reaction product of an epoxy resin and a metal complex which is a reaction product of tungsten carbonyl and/or molybdenum carbonyl with pyrrolidine.

4,256,869

POLYURETHANES FROM TRANS-CYCLOHEXANE-1,4-DIISOCYANATE

Helmut Schulze, Aschaffenburg; Hans Zengel, Kleinwallstadt; Walter Brodowski, Amorbach, all of Fed. Rep. of Germany; Franciscus J. Huntjens, Arnheim; Jan A. J. Schutijser, Dieren, both of Netherlands, and Peter Hentschel, Laudenbach, Fed. Rep. of Germany, assignors to Akzo N.V., Arnheim, Netherlands

Filed Jun. 28, 1979, Ser. No. 52,981
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829199
Int. Cl.[3] C08G 18/75
U.S. Cl. 528—67 29 Claims

1. Polyurethanes obtained through the reaction of macrodiols with a molecular weight between about 800 and 4000, cyclohexane-1,4-diisocyanate with a trans-isomer content of at least 90% based on the total cyclohexane-1,4-diisocyanate, and lower molecular chain extenders with at least two labile hydrogens.

4,256,870

SOLVENTLESS RELEASE COMPOSITIONS, METHODS AND ARTICLES OF MANUFACTURE

Richard P. Eckberg, Round Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 17, 1979, Ser. No. 40,015
Int. Cl.[3] C08G 77/20, 77/12; C08L 83/06
U.S. Cl. 528—15 20 Claims

1. A silicone composition comprising:

(a) a diorganopolysiloxane base polymer having up to approximately 20% by weight alkenyl or silanol functional groups and having a viscosity ranging from approximately 50 to approximately 100,000 centipoise at 25° C.;

(b) a polymethylhydrogen siloxane fluid crosslinking agent having up to approximately 100% by weight SiH groups and having a viscosity in the range of approximately 25 to approximately 1000 centipoise at 25° C.;

(c) an effective amount of precious metal catalyst for facilitating an addition cure hydrosilation reaction between said base polymer and said crosslinking agent; and

(d) an amount of dialkyl carboxylic ester containing carbon to carbon unsaturation effective to inhibit the precious metal catalyzed hydrosilation cure reaction of said silicone composition at temperatures below the heat cure temperature of said silicone composition.

4,256,871

SYNTHETIC POLYMER EMULSIFIER FROM CONDENSATION OF NAPHTHALENE SULFONIC ACID, ALKYL BENZENE SULFONIC ACID AND FORMALDEHYDE

John G. Papalos, Ledgewood, and Ronald W. Kavchok, Belle Mead, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Apr. 18, 1979, Ser. No. 31,113
Int. Cl.[3] C08G 16/02
U.S. Cl. 528—265 9 Claims

1. A condensation product of 1 mole of naphthalenesulfonic acid, from about 0.1 to about 5 moles of linear alkylbenzenesulfonic acid having an alkyl moiety of from about 4 to about 20 carbon atoms, and from about 0.26 to about 3.1 moles of formaldehyde, produced by heating at about 70° C. to about 150° C. until the formaldehyde has reacted, and salts thereof.

4,256,872

PROCESS FOR PREPARING LAYERED ORGANOPHOSPHORUS INORGANIC POLYMERS

Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 945,971, Sep. 26, 1978. This application May 30, 1979, Ser. No. 43,810

The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.

Int. Cl.[3] C08G *79/04, 79/14*

U.S. Cl. 528—395 37 Claims

1. A process for the production of phosphorus containing organo substituted inorganic polymers which comprises reacting in a liquid medium at least one organophosphorus acid compound of the formula:

$$[(HO)_2OP]_nR$$

wherein n is 1 or 2 and R is an organo group covalently coupled to phosphorus and wherein when n is 2, R contains at least two carbon atoms and is directly or indirectly coupled to the phosphorus atoms through different carbon atoms whereby the two phosphorus atoms are separated by at least two carbon atoms, with at least one tetravalent metal ion selected from the group consisting of zirconium, cerium, thorium, uranium, titanium, lead and mixtures thereof to precipitate from the liquid medium, a solid inorganic polymer in which, in the solid inorganic polymer, the molar ratio of phosphorus to tetravalent metal is about 2 to 1 and in which the organo group is covalently bonded to phosphorus and phosphorus is linked to the tetravalent metal through oxygen.

4,256,873

PROCESS FOR THE PRODUCTION OF ORGANIC HYDROXY SILICATE COMPOUNDS AND THEIR RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed Dec. 18, 1978, Ser. No. 970,449

Int. Cl.[3] C08G *8/04*

U.S. Cl. 528—425 24 Claims

1. The process for the production of an epoxy silicate resinous product by the following steps:

(a) mixing 1 part by weight of fine granular silica with 1 to 6 parts by weight of an organic polyhydroxy compound;

(b) adding 0.25 to 1 part by weight of an alkali metal hydroxide catalyst, selected from the group consisting of sodium hydroxide and potassium, in water;

(c) heating the mixture to just below the boiling temperature of the mixture while agitating for 30 to 60 minutes, thereby producing an organic hydroxy silicate compound;

(d) adding 2 to 3 mols of an epoxy compound to about 1 mol of said organic hydroxy silicate compound then agitating while heating, at ambient pressure to 60 psig, to just below the boiling temperature of the reactants for 10 to 60 minutes, thereby

(e) producing an epoxy organic hydroxy silicate compound;

(f) adding a catalytic amount to 1 mol for each mol of the epoxy hydroxide silicate compound of a catalyst selected from the group consisting of a Lewis acid and an amine compound, thereby

(g) producing an epoxy silicate resinous product.

4,256,874

PROCESS FOR SEPARATING ISOTACTIC AND ATACTIC POLYPROPYLENES

Gilbert Marie, Pau, France, assignor to Ato Chimie, Paris, France

Continuation of Ser. No. 812,455, Jul. 5, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,683

Claims priority, application France, Jul. 12, 1976, 7621292

Int. Cl.[3] C08F *6/00*

U.S. Cl. 528—486 13 Claims

1. A process for obtaining purified polypropylene which comprises polymerizing propylene in the presence of a Ziegler catalyst containing titanium chloride, aluminum chloride and alkyl aluminum chloride to obtain a crude solid polymer, contacting said crude polymer with a treatment liquid comprising (a) an azeotropic mixture having a boiling point of less than 100° C. of a hydrocarbon and a lower alcohol, (b) 1–5% based on the weight of said mixture of a diketone or ketone ester and (c) carboxylic acid selected from the group consisting of aliphatic carboxylic and benzoic acid and acetyl salicylic acid, and recovering the resulting purified isotactic polypropylene and the resulting purified atactic polypropylene.

4,256,875

EXTRACTION OF SENNOSIDES

Jean P. Gabriel, St. Symphorien; Marcel Dumont, St. Cyr-sur-Loire, and Robert Guille, Tours, all of France, assignors to Synthelabo, Paris, France

Filed Apr. 11, 1979, Ser. No. 29,007

Claims priority, application France, Apr. 14, 1979, 78 11023

Int. Cl.[3] C07H *15/24*

U.S. Cl. 536—4 5 Claims

1. A process for the extraction of sennosides from senna folioles or follicles, comprising rapidly exhausting said senna folioles or follicles with cold water in a neutral or slightly alkaline medium, followed by acidification and extraction of the thus exhausted product with butanol.

4,256,876

PROCESS FOR PRECIPITATING AMINOGLYCOSIDES

Roger G. Harrison, Jr., Kalamazoo, and Thomas H. Prichard, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 4, 1980, Ser. No. 118,408

Int. Cl.[3] C07H *1/06*

U.S. Cl. 536—12 9 Claims

1. A process for precipitating an amorphous aminoglycoside antibiotic salt, selected from the group consisting of sulfate, hydrochloride and nitrate salt, from an aqueous solution containing the same which comprises:

(a) concentrating said aqueous solution to a solids concentration of about 400 mg./ml. to the solubility limit of the aminoglycoside antibiotic to obtain an aqueous concentrate; and

(b) adding said aqueous concentrate to an agitated water-miscible lower aliphatic alcohol at a ratio of about 4 to about 10 vol. alcohol/vol. aqueous to obtain an amorphous precipitate of the aminoglycoside anitibiotic salt.

3. A process, according to claim 1, wherein said aminoglycoside antibiotic salt is neomycin sulfate.

4,256,877

METHOD OF MANUFACTURING CELLULOSE DERIVATIVE

Alf H. Karlsson, Njurunda; Hans E. Lundström, Alnö, and Lars-Henrik Olsson, Njurunda, all of Sweden, assignors to SCA Development Aktiebolag, Sweden

Filed Dec. 13, 1977, Ser. No. 860,250

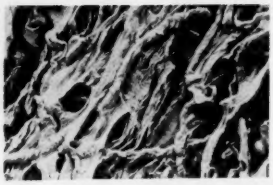
Claims priority, application Sweden, Dec. 21, 1976, 7614342

Int. Cl.[3] C08B *3/22*

U.S. Cl. 536—59 21 Claims

1. An absorbent cellulose material, comprising a substituted cellulose material having an average degree of substitution sufficiently low to render said material insoluble in water, said material comprising fibers having an increased surface area

formed by swelling said material, fixing said material in said swelled state, and drying said material while maintaining said



material in said swelled state, thereby bursting said fibers during drying.

4,256,878

POLYENE COMPOUNDS

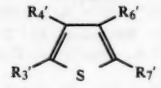
Michael J. Klaus, Weil am Rhein, Fed. Rep. of Germany, and Beverly A. Pawson, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 904,950, May 11, 1978, which is a division of Ser. No. 801,688, May 31, 1977, Pat. No. 4,116,975, which is a division of Ser. No. 733,507, Oct. 18, 1976, Pat. No. 4,061,656, which is a continuation-in-part of Ser. No. 632,029, Nov. 14, 1975, abandoned. This application Apr. 16, 1980, Ser. No. 140,938

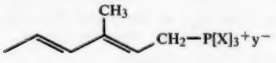
Int. Cl.³ C07D *333/06, 333/24*

U.S. Cl. 542—412 **2 Claims**

1. A compound represented by the formula



wherein one of R'_6 or R'_7 is



and the other of R'_6 or R'_7 and R'_3 and R'_4 are hydrogen, lower alkyl thio, lower alkoxy-lower alkyl, hydroxy methyl, halogen, lower alkyl, lower alkoxy, amino, carboxyl, mono(lower alkyl-)amino, di(lower alkyl)amino, mono(lower alkyl)amino lower alkyl, di(lower alkyl)amino lower alkyl, hydroxy, lower alkenyl, lower alkenoxy, lower alkanoyl, lower alkanoyloxy, nitro, lower alkoxycarbonyl or lower alkanoylamido, X is aryl selected from the group consisting of phenyl, lower alkyl-substituted phenyl and lower alkoxysubstituted phenyl, y is an anion of an organic acid or an inorganic acid and all of the lower alkyl, lower alkenyl and lower alkanoyl groups in the above radicals have up to 6 carbon atoms.

4,256,879

ESTERS OF MONIC AND ISOMONIC ACIDS

Kong Luk, Cranleigh; John P. Clayton, Horsham, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

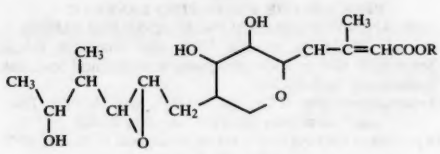
Division of Ser. No. 872,806, Jan. 27, 1978, which is a division of Ser. No. 803,466, Jun. 6, 1977, Pat. No. 4,102,901. This application Jun. 11, 1979, Ser. No. 47,303

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.³ C07C *407/14*

U.S. Cl. 542—427 **5 Claims**

1. A compound of the formula:



wherein R is furylmethyl, tetrahydrofurylmethyl or 2,3-epoxypropyl.

4,256,880

CONTINUOUS MORPHOLINE PROCESS

Kenneth J. Frech, and Lawson G. Wideman, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 16, 1979, Ser. No. 58,043

Int. Cl.³ C07D *295/02*

U.S. Cl. 544—106 **7 Claims**

1. In a method for the preparation of morpholine by reacting diethyleneglycol and ammonia, the improvement characterized by using as a catalyst, a particular granular form of modified Raney nickel catalyst which has been prepared by reacting a nickel aluminum alloy with an alkaline earth or an alkali metal hydroxide, and in which the ammonia employed is an aqueous solution of ammonia, and in which the molar ratio of ammonia to diethyleneglycol ranges from about 1.2/1 to about 10/1, and the molar ratio of water to diethyleneglycol ranges from about 2.35/1 to about 12.46/1, said reaction being conducted in the absence of hydrogen, and said reaction being conducted as a continuous reaction.

4,256,881

BLOCKED BENZOTRIAZOLE COMPOUNDS AS DEVELOPMENT RESTRAINER PRECURSORS

Michael J. Simons, Ruislip; David T. Southby, West Harrow, both of England, and Hans G. Ling, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

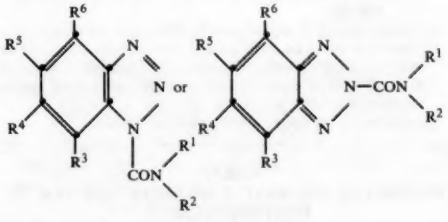
Filed Oct. 18, 1979, Ser. No. 86,116

Claims priority, application United Kingdom, Oct. 20, 1978, 41437/78

Int. Cl.³ C07D *413/06, 401/06*

U.S. Cl. 544—132 **4 Claims**

1. A compound having either of the following formulas:



wherein:

R^1 and R^2 together complete a morpholine ring or a piperidine ring; and

R^3, R^4, R^5 and R^6 each represent hydrogen, nitro, lower alkyl, halogen, carbamoyl, sulfamoyl, RCONH-, or RSO_2NH-, wherein R is lower alkyl or aryl of 6 to 10 carbon atoms.

4,256,882
REACTIVE DYESTUFFS

Adolf Friedrich, Leverkusen; Horst Harnisch, Cologne, and Roderich Raue, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

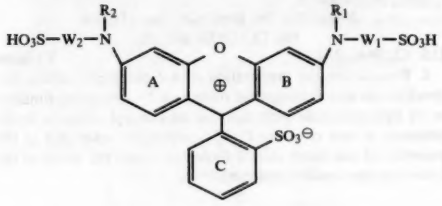
Filed Aug. 3, 1976, Ser. No. 711,142

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1975, 2535077

Int. Cl.[3] **C07D** *405/12, 311/82*

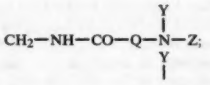
U.S. Cl. 544—212 **2 Claims**

1. Reactive dyestuff of the formula



or the alkali or ammonium salt thereof, wherein

R_1 is



R_2 is CH_2—NH—CO—Q—N—Z; hydrogen; C_1–C_4-alkyl; chloro-C_1–C_4-alkyl; bromo-C_1–C_4-alkyl; cyano-C_1–C_4-alkyl; C_1–C_4-alkoxy-C_1–C_4-alkyl; cyclohexyl; cyclopentyl; phenyl-C_1–C_2-alkyl; phenyl-C_1–C_2-alkyl substituted with methyl, ethyl, methoxy, ethoxy, chloro, or bromo; phenyl; or phenyl substituted with methyl, methoxy, chloro, or bromo;

W_1 and W_2 are C_2–C_4-alkylene;

Y is hydrogen, methyl, or ethyl;

Z is a fibre reactive radical reactable with polyamides and cellulose and free from groups conferring solubility in water; and

Q is C_1–C_3-alkylene.

4,256,883
PYRIDOZA PROSTACYCLIN ANALOGUES AND N-OXIDES THEREOF

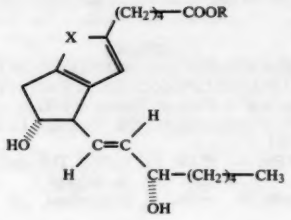
Kyriacos C. Nicolaou, Havertown; William E. Barnette, Levittown, both of Pa., and Ronald L. Magolda, Vineland, N.J., assignors to Research Corporation, New York, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,543

Int. Cl.[3] **C07D** *237/26;* **A61K** *31/50*

U.S. Cl. 544—235 **8 Claims**

1. Stable biologically active aromatic prostacyclin analogues having the formula



wherein X represents —N=N—, or

and

R represents hydrogen, a pharmaceutically acceptable cation or a pharmaceutically acceptable lower alkyl group.

4,256,884
1-BENZOYL-3-HYDROXY-6(1H)-PYRIDAZINONES AND USE AS PLANT GROWTH REGULATORS

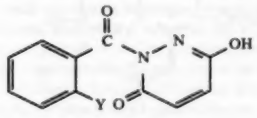
Otto L. Hoffmann, Wilmington, Del., and Natu R. Patel, Overland Park, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1980, Ser. No. 124,991

Int. Cl.[3] **C07D** *237/16;* **A01N** *43/58*

U.S. Cl. 544—240 **6 Claims**

1. A compound having the structural formula



in which Y is —COOH or an agriculturally acceptable salt thereof, —COOR, —CH_2OH, —CHO, or —OR, and R is C_1 to C_4 alkyl or alkenyl.

4,256,885
PROCESS FOR THE PREPARATION OF 1-(2-TETRAHYDROFURYL)-5-FLUOROURACIL

Atsushi Kojima, Yokohama; Yoshitsugu Kohno, Omuta; Yoshimasa Ike, Yokohama; Tatsuro Yokoyama, Yokohama, and Makoto Odate, Yokohama, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,433

Claims priority, application Japan, Dec. 24, 1975, 50/153403; Jan. 9, 1976, 51-1600; Jan. 22, 1976, 51-5408; May 20, 1976, 51-57255

Int. Cl.[3] **C07D** *405/04*

U.S. Cl. 544—313 **9 Claims**

1. A method for producing 1-(2-tetrahydrofuryl)-5-fluorouracil which comprises heating a reacting mixture comprising 5-fluorouracil and 2,3-dihydrofurane in the pressure of a reaction accelerator selected from the group consisting of an amine salt, a mixture of an organic base and a metal halide, an amphoteric compound, an ion exchange resin, a metal chelate, an onium compound, a Lewis acid selected from the group consisting of boron trifluoride, boron trifluoride etherate and tetrabutoxy titaniu, a solid acidic catalyst selected from the group consisting of acid clay, kaolin, alumina, silica-magnesia,

silica-alumina, molecular sieves, titanium oxide, nickel sulfate, aluminum sulfate and silver nitrate, and active carbon.

4,256,886

PROCESS FOR THE PREPARATION OF OXADIAZOLOPYRIMIDINE DERIVATIVES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

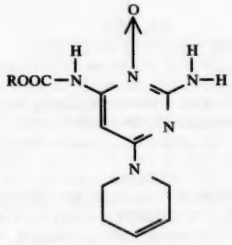
Division of Ser. No. 55,230, Jul. 6, 1979. This application Feb. 21, 1980, Ser. No. 123,145

Claims priority, application Switzerland, Jul. 21, 1978, 7910/78

Int. Cl.³ C07D *401/04, 239/48*

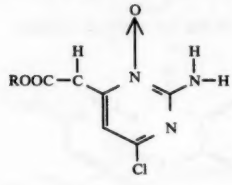
U.S. Cl. 544—323 **4 Claims**

1. A compound of the formula

II 

wherein R is alkyl or alkoxyalkyl.

3. A compound of the formula

VIII 

wherein R is alkyl or alkoxyalkyl.

4,256,887

1,2,4-TRIAZOLES AND A METHOD FOR THEIR PREPARATION

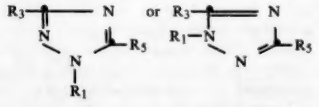
Frederick C. Novello, Berwyn, and John J. Baldwin, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 894,450, Apr. 6, 1978, Pat. No. 4,198,513, which is a division of Ser. No. 740,290, Nov. 9, 1976, Pat. No. 4,102,889, which is a continuation of Ser. No. 543,563, Jan. 23, 1975, abandoned, which is a division of Ser. No. 392,842, Aug. 29, 1973, Pat. No. 3,879,404, which is a division of Ser. No. 269,685, Jul. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 75,785, Sep. 25, 1970, abandoned. This application Sep. 13, 1979, Ser. No. 75,344

Int. Cl.³ C07D *401/14;* **A61K** *31/47*

U.S. Cl. 544—333 **4 Claims**

1. A compound of the formula:



and the pyridine-N-oxides and non-toxic salts thereof, wherein

R_1 is hydrogen, lower alkyl, lower alkanoyl, benzyl, methnaphthyl, carbamoyl, lower alkylcarbamoyl or di-lower alkylcarbamoyl;

R_3 is pyridyl and

R_5 is pyrimidinyl or pyrazinyl.

4,256,888

PREPARATION OF 2-CHLOROPYRIMIDINES

Jeffrey J. Vanderbilt; William C. Gose, and James P. Cleveland, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,044

Int. Cl.³ C07D *239/30*

U.S. Cl. 544—334 **3 Claims**

1. Process for the preparation of a 2-chloropyrimidine hydrochloride which comprises treating a 2-mercaptopyrimidine or its hydrochloride with chlorine or sulfuryl chloride in the presence of one or more C_2–C_4 carboxylic acids and in the presence of not more than 2 moles of water per mole of the 2-mercaptopyrimidine reactant.

4,256,889

PROCESS FOR THE PREPARATION OF IMINO-BRIDGED BENZOCYCLOHEPTAPYRIDINES

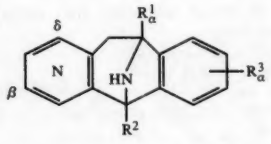
Kenneth L. Shepard, Ambler, Pa., and Daniel G. Brenner, Medford, Mass., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 959,049, Nov. 9, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,410

Int. Cl.³ C07D *471/18*

U.S. Cl. 546—63 **4 Claims**

1. A process for the preparation of a compound of structural formula:



wherein N is in the β- or δ-position; R^2 is

(1) lower alkyl,

(2) lower alkenyl,

(3) phenyl-lower alkyl,

(4) lower cycloalkyl, or

(5) lower(cycloalkyl-alkyl);

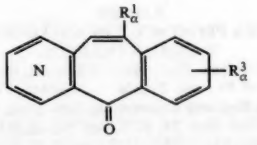
$R_\alpha{}^1$ is hydrogen or R^2,

$R_\alpha{}^3$ is

(1) hydrogen, or

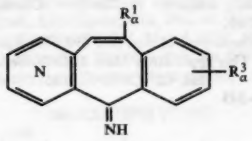
(2) halogen, which comprises the following steps, in sequence:

(a) treatment of a compound of formula:



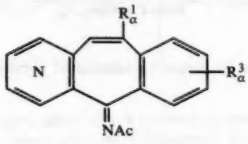
wherein $R_\alpha{}^3$ is halo or hydrogen, with gaseous ammonia in the presence of titanium tetrachloride;

(b) treatment of the resulting imine of structure:



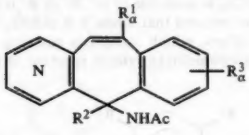
with an acylating agent selected from tosyl chloride, benzenesulfonyl chloride, C_{1-3} alkanoyl chloride, benzoyl chloride and a C_{1-3} lower alkyl chloroformate in the presence of an acid acceptor;

(c) treatment of the resulting acylimine of structure:

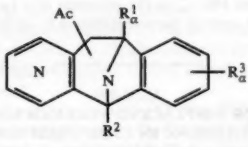


wherein Ac is tosyl, benzenesulfonyl, C_{1-3} alkanoyl, benzoyl, or C_{1-3} alkoxycarbonyl, with an alkyl lithium of formula R^2Li:

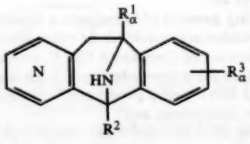
(d) treatment of the resulting acylamine of structure:



with an alkali metal hydroxide to produce the acylimine of structure:



(e) treatment of the acylimine of Step (d) with a strong acid or strong base, or where Ac is an arylsulfonyl group with sodium bis(2-methoxyethoxy)aluminum hydride, to produce the imine of formula:



4,256,890

3,4-DIHYDROCARBOSTYRIL DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Kazuyuki Nakagawa; Nanami Murakami, both of Tokushima; Shiro Yoshizaki, Komatsujima; Hideo Mori, and Michiaki Tominaga, both of Tokushima, all of Japan, assignors to OtsukaPharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 601,569, Aug. 1, 1975, abandoned, which is a continuation of Ser. No. 325,591, Jan. 23, 1973, abandoned. This application Mar. 14, 1978, Ser. No. 886,373

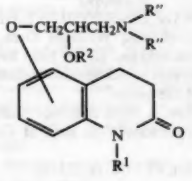
Claims priority, application Japan, Sep. 14, 1972, 47-92558; Sep. 14, 1972, 47-92560; Dec. 2, 1972, 47-120953; Dec. 2, 1972, 47-125858; Dec. 2, 1972, 47-128972; Dec. 14, 1972, 47-92557

The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.³ C07D *215/22*

U.S. Cl. 546—158 **22 Claims**

1. A 3,4-dihydrocarbostyril compound represented by the formula



(I)

wherein R^1 is selected from the group consisting of hydrogen straight or branched alkyl having 1 to 4 carbon atoms, phenylalkyl wherein the alkyl has 1 to 4 carbon atoms, and alkenyl having 2 to 4 carbon atoms, R^2 is selected from the group consisting of hydrogen and acyl of the formula COR^3 wherein R^3 represents lower alkyl having 1 to 4 carbon atoms, phenyl or 3,4,5-trimethoxy phenyl, and R′ and R″ may be the same or different and each represents hydrogen, lower alkyl having 1 to 4 carbon atoms, phenylalkyl wherein the alkyl has 1 to 4 carbon atoms or cycloalkyl of 4 to 6 carbon atoms, or R′ and R″, when taken together with the nitrogen atom to which they are attached, may form a heterocyclic group selected from the group consisting of piperidino, piperazino and morpholino, said heterocyclic group being unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, and pharmaceutically acceptable acid addition salts thereof, with the proviso that when substitution is at the 5-position and R^1 and R^2 are hydrogen and one of R′ and R″ is hydrogen, the other of R′ and R″ is not a 1 to 4 carbon atom alkyl group.

4,256,891

(2-AMINO-2-OXOETHOXY)ACETIC ACID COMPOUNDS

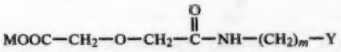
Michael J. Umen, Glenside, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Division of Ser. No. 904,080, May 8, 1978, Pat. No. 4,197,315, which is a division of Ser. No. 829,117, Aug. 30, 1977, Pat. No. 4,123,538. This application Aug. 31, 1979, Ser. No. 71,516

Int. Cl.³ C07D *211/14, 295/14*

U.S. Cl. 546—234 **3 Claims**

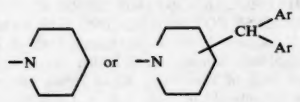
1. A (2-amino-2-oxoethoxy)acetic acid compound represented by the formula



wherein

M is hydrogen, alkali metal, alkaline earth metal, or quaternary ammonium; and

Y is a radical represented by



wherein

each Ar independently is phenyl, trifluoromethylphenyl, halo-substituted-phenyl, lower alkyl-substituted-phenyl or lower alkoxy-substituted-phenyl;

m is an integer of from 2 to 6; and the acid addition salts thereof.

4,256,892

PREPARATION OF BIS-2-PYRIDYL-DISULFIDES

Manfred Maurer, Kirchheim; Winfried Orth, Hassloch, and Werner Fickert, Mannheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,323

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904548

Int. Cl.³ C07D *213/62*

U.S. Cl. 546—261 **8 Claims**

1. In a process for the preparation of bis-2-pyridyl-disulfide or bis-(2-pyridyl-1-oxide)-disulfide optionally substituted on the pyridyl ring with at least one substituent selected from the group consisting of halogen and alkyl and alkoxy of 1 to 4 carbon atoms by oxidation of the corresponding 2-mercapto-pyridine or its N-oxide, the improvement comprising effecting the oxidation in an aqueous acid media containing an alkali metal or alkaline earth metal chlorite.

4,256,893

SUBSTITUTED PHENOXY AND PHENYLTHIO PYRIDINE METHANOLS AND SUBSTITUTED METHANOLS

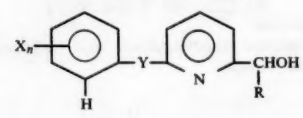
Sudarshan K. Malhotra, Walnut Creek, and Michael J. Ricks, Martinez, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 859,908, Dec. 12, 1977, Pat. No. 4,163,787, which is a continuation-in-part of Ser. No. 777,188, Mar. 14, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,752

Int. Cl.³ C07D *213/64, 213/70*

U.S. Cl. 546—301 **13 Claims**

1. A compound corresponding to the formula



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro or bromo; n represents an integer of 0 to 2; Y represents oxygen or sulfur and R represents cyano or ethynyl.

4,256,894

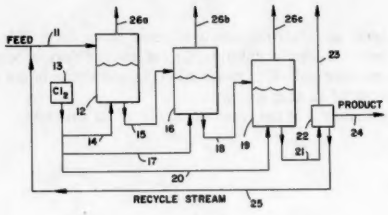
PREPARATION OF CHLORINATED PYRIDINES

Thomas J. Dietsche, Berkeley, and Jim Love, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

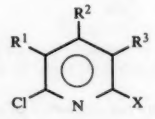
Continuation-in-part of Ser. No. 899,675, Apr. 24, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,646

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—345 **29 Claims**

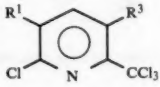


1. A process for preparing substituted pyridines of the formula:



(A)

wherein X represents chloro or —CCl_3, R^1, R^2 and R^3 each independently represent chloro or H, with the proviso that when X is —CCl_3, at least one of R^1, R^2 or R^3 is always Cl and with the further proviso that when X is chloro, one of R^1 and R^3 is always chloro, which comprises reacting a chloro-substituted 6-(trichloromethyl)pyridine reactant of the formula:



(B)

wherein R^1 and R^3 represent chloro or H, in the liquid state, with chlorine, said reaction being carried out at a temperature of at least about 160° C. in the presence of a Lewis acid type catalyst and an amount thereof effective to catalyze said reaction.

4,256,895

PROCESS FOR DISPLACING NUCLEAR IODINE WITH CHLORINE IN IODIPYRIDINES

Edwin C. Steiner, and G. Edwin Vrieland, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 4, 1979, Ser. No. 72,705

Int. Cl.³ C07D *213/04*

U.S. Cl. 546—345 **3 Claims**

1. A process for replacing with chlorine moieties nuclear iodine substituents borne by an iodopyridine compound comprising the steps of:

(a) introducing gaseous chlorine into a liquid medium containing trichloroiodopyridine or tetrachloroiodopyridine at a temperature of from about 100° C. to about 250° C., so as to displace the iodine substituent from the iodopyridine compound and thereby produce the corresponding chloropyridine compound; and

(b) separating the chloropyridine compound from the displaced iodine.

4,256,896

NAPHTHOLACTAM DYESTUFFS

Hansrudolf Schwander, Riehen, and Christian Zickendraht, Binningen, both of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

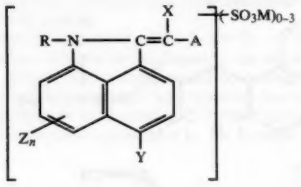
Continuation of Ser. No. 793,564, May 4, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,311

Claims priority, application Switzerland, Jun. 1, 1976, 6858/76

Int. Cl.[3] C07D *277/62*

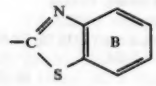
U.S. Cl. 548—160 6 Claims

1. A naphtholactam dyestuff of the formula



wherein

R is hydrogen, alkyl of 1–8 carbons, hydroxyalkyl of 2–3 carbons, alkoxyalkyl of 3–8 carbons, β-chloroethyl, β-cyanoethyl, alkoxycarbonylethyl wherein the alkoxy moiety thereof has 1–4 carbons, carbamoylethyl, N-alkylcarbamoylethyl wherein the alkyl moiety thereof has 1–4 carbon atoms, N,N-dialkylcarbamoylethyl wherein each alkyl moiety thereof has 1–4 carbon atoms, cyclohexyl, benzyl, phenethyl, phenyl, or alkenyl of 1–5 carbon atoms; Y is —CN, —COCl, —CO—Q′ or —$COOR_1$; X is —COOH, —$COO^{\ominus}$ cation$^{\oplus}$, —CN, —$COOR_1$, or —SO_2T; A is



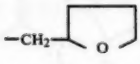
wherein

the ring B is unsubstituted or mono-substituted by halo, lower alkyl, lower alkoxy, hydroxy, cyano, vinyl, nitro, lower alkylamino, dialkylamino, phenylamino N-phenyl -N-alkylamino, phenyl or phenoxy;

Z is C_1–C_4 alkyl, C_1–C_4 alkoxy, Cl, Br, NO_2, phenylsulfonyl, C_1–C_4 alkyl —S—, C_1–C_4 alkylsulfonyl, cyano, —$CONH_2$, —$CONH(C_1$–C_4 alkyl), $CON(C_4$ alkyl)$_2$;

n is 0, 1 or 2;

R_1 and R_1' are independently C_1–C_{18} alkyl which is unsubstituted or substituted by C_1–C_4 alkoxy, hydroxy, chloro, bromo, cyano, carboxy, carb-C_1–C_4-alkoxy, sulfo, carboxamido or acetoxy; cyclopentyl; methylcyclohexy; trimethylcyclohexyl; cyclohexyl; phenyl, benzyl or phenethyl which are unsubstituted or monosubstituted by C_1–C_4-alkyl, lower alkoxy or halo; —$CH_2CH_2SCH_2CH_2OH$; C_2–C_5 alkenyl; or



Q′ is NHR_1' or NR_1', R_2' wherein R_2' has the same meaning as R_1' as defined above;

T is C_1–C_8 alkyl, C_2–C_8 alkenyl or C_6–C_9 phenyl; and

M is hydrogen or a cation.

4,256,897

PROCESS FOR THE PREPARATION OF L-ASPARTIC ACID N-THIOCARBOXYANHYDRIDE

Fredric J. Vinick, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,641

Int. Cl.[3] C07D *277/04*

U.S. Cl. 548—183 8 Claims

1. A process for preparing L-aspartic acid N-thiocarboxyanhydride which comprises contacting a 0.75 to 1.25 molar solution of an N-alkoxythiocarbonyl-L-aspartic acid, wherein said alkoxy group is of 1 to 3 carbon atoms, in an alkyl acetate solvent having from 1 to 4 carbon atoms in said alkyl group, with a phosphorous trihalide selected from phosphorous tribromide and phosphorous trichloride at a temperature from about −10° C. to 50° C. and recovering the solid L-aspartic acid N-thiocarboxyanhydride produced.

4,256,898

α(SUBSTITUTED) AMINO-3-SUBSTITUTED-2-ISOXAZOLINE-5-ACETIC ACIDS (ESTERS)

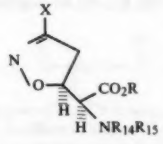
Robert C. Kelly, and Wendell Wierenga, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 905,963, May 15, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 62,857

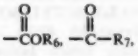
Int. Cl.[3] C07D *261/04*

U.S. Cl. 548—240 21 Claims

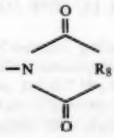
1. Racemic mixtures and optically active isomers of compounds having the formula



wherein R is selected from the group consisting of hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 3 halogen atoms, and 1 to 5 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, and substituted aralkyl of from 7 to 20 carbon atoms, inclusive; X is selected from the group consisting of bromine, chlorine, fluorine and iodine, —OR_1, —SR_1, and —$NR'R''$ wherein R_1 is selected from the group consisting of alkyl of from 1 to 12 carbon atoms, inclusive, aryl of from 6 to 20 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive; R′ and R″ are the same or different and are selected from the group consisting of hydrogen and alkyl of from 1 to 8 carbon atoms, inclusive, R_{14} and R_{15} are selected from the group consisting of hydrogen,



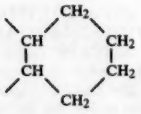
inclusive, or when taken together with the nitrogen atom form the group



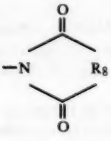
wherein R_6 is alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and

1 to 3 halogen atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, and substituted aralkyl of from 7 to 20 carbon atoms, inclusive, R_7 is selected from the group consisting of alkyl of from 1 to 12 carbon atoms, inclusive, aryl of from 6 to 20 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, substituted aralkyl of from 7 to 20 carbon atoms, inclusive, and R_8 is selected from the group consisting of (a)

where R_9, R_{10}, R_{11} and R_{12} are selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, inclusive, (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylene, with the proviso that when R, R_{14} and R_{15} are all hydrogen, X cannot be chlorine, and with the further proviso that when X is chlorine and R is either hydrogen or lower alkyl of from 1 to 8 carbon atoms, inclusive, neither R_{14} nor R_{15} can be alkoxycarbonyl nor can R_{14} and R_{15} together with the nitrogen atom be the group



wherein R_8 is defined as above.

4,256,899

PROCESS FOR THE PRODUCTION OF 3-AMINO-5-T-BUTYLISOXAZOLE

Yasuo Makisumi, Kawanishi; Akira Murabayashi, Ibaraki; Akira Takase, Kobe; Ichiro Ishizuka, and Shinzaburo Sumimoto, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Oct. 5, 1979, Ser. No. 82,405

Claims priority, application Japan, Oct. 12, 1978, 53-125980

Int. Cl.[3] C07D *261/14*

U.S. Cl. 548—246 **8 Claims**

1. Process for preparing 3-amino-5-t-butylisoxazole which comprises reacting pivaloylacetonitrile with hydroxylamine in an aqueous medium at pH 7.0–9.0, and treating the reaction products with an acid selected from the group consisting of hydrochloric acid, sulfuric acid, nitric acid and hydrobromic acid in an amount of 0.3–0.5 mol equivalent in excess of the amount which would be enough to neutralize the reaction mixture.

4,256,900

FLUORESCENT AZOLYL BENZOCOUMARIN DYESTUFFS

Roderich Raue, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

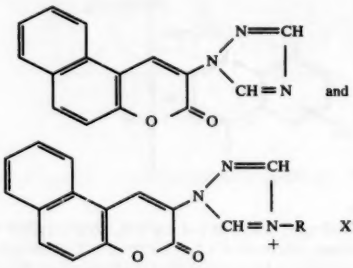
Continuation of Ser. No. 874,146, Feb. 1, 1978, abandoned. This application May 29, 1979, Ser. No. 43,247

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704825

Int. Cl.[3] C07D *405/04*; C09K *9/02, 11/06*

U.S. Cl. 548—262 **4 Claims**

1. A fluorescent dyestuff selected from the group consisting of



in which

R is C_1–C_4-alkyl, or C_1–C_4 alkyl substituted by OH, C_1–C_4-alkoxy or phenyl-C_1–C_4-alkoxy, and

X is an inorganic or organic acid radical.

4,256,901

PHTHALONE DERIVATIVES UTILIZABLE AS PIGMENTS

Philippe Y. E. Gangneux, Bihorel, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

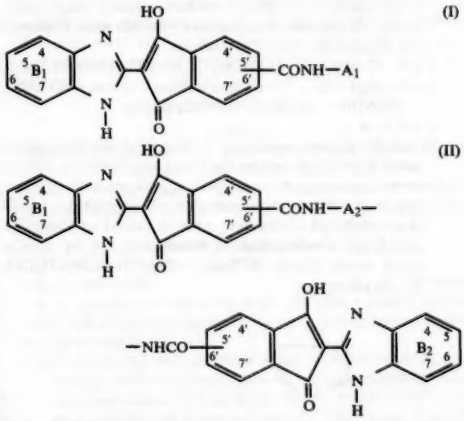
Filed Jan. 4, 1979, Ser. No. 1,042

Claims priority, application France, Jan. 13, 1978, 78 00889

Int. Cl.[3] C07D *235/04*

U.S. Cl. 548—268 **10 Claims**

1. A phthalone represented by one of the following formulas:



in which A_1 represents:

an aliphatic or alicyclic radical,

a diphenyl or naphthalene radical,

an anthraquinone radical or an anthraquinone radical substituted by one or two chlorine or bromine atoms,

a benzene radical or a benzene radical bearing up to five non-solubilizing substituents selected from halogen, lower alkyl, lower alkoxy, nitro, cyano, acetylamino, benzoylamino, phenylaminocarbonyl and phenylamino, or

a pyridine, 1,2,4-triazole, 3(5)phenyl-5(3)pyrazole or benzothiazole radical;

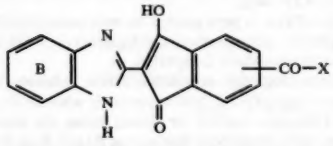
A_2 represents:

a benzene radical or a benzene radical bearing up to four substituents selected from chlorine, cyano, bromine, methoxy, ethoxy and methyl, or

a pyridine, diphenyl, naphthalene, anthraquinone, diphenylamine, diphenyloxide, diphenylsulfide, benzanilide, benzophenone, diphenylurea, diphenylsulfone or diphenylsulfoxide radical;

and each of the benzene nuclei B_1 and B_2 can bear one or two substituents selected from halogen, lower alkyl, lower alkoxy, nitro, phenyl, alkylcarbonylamino containing 2 to 4 carbon stoms, benzoylamino and benzoylamino bearing one or two nitro groups, or be coupled with another benzene nucleus.

8. A compound represented by the formula:



(IV)

in which X represents a hydroxy group or a chlorine or bromine atom and the nucleus B can bear one or two substituents selected from halogen, lower alkyl, lower alkoxy, nitro, phenyl, alkylcarbonylamino containing 2 to 4 carbon atoms, benzoylamino and benzoylamino bearing one or two nitro groups, or is coupled with another benzene nucleus.

4,256,902
PROCESS FOR THE PREPARATION OF 3-CHLORO-5-HYDROXYPYRAZOLES

Pier M. Boschi, Piacenza; Franco Gozzo, and Angelo Longoni, both of Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

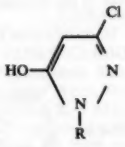
Continuation-in-part of Ser. No. 971,548, Dec. 20, 1978. This application Mar. 12, 1980, Ser. No. 129,724

Claims priority, application Italy, Dec. 23, 1977, 31190 A/77; Dec. 23, 1977, 31191 A/77

Int. Cl.³ C07D *231/20, 231/22*

U.S. Cl. 548—365 **1 Claim**

1. A process for the preparation of a 3-chloro-5-hydroxypyrazole having the formula:



(I)

wherein R is H; alkyl with from 1 to 7 carbon atoms optionally substituted by one CN group; phenyl; or benzyl; characterized in that a hydrazine of the formula:

R—NH—NH—CO—R′

wherein R has the meanings indicated above and R′ is NH_2 or O-alkyl, is reached with β,β-dichloro-acryloyl chloride and the reaction product thus obtained is subjected to the action of an aqueous alkali thereby obtaining a compound of formula (I) in the form of an alkaline salt, which in turn is treated with an acid solution.

4,256,903
POLYMER INHIBITION

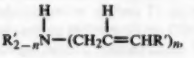
Gary D. Macdonell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 17, 1980, Ser. No. 130,677

Int. Cl.³ C07D *333/48*

U.S. Cl. 549—87 **8 Claims**

1. A process for the production of a sulfolene which comprises reacting SO_2 and a conjugated diene in the presence of a small but effective amount, sufficient to minimize polymer formation, of an alkenyl amine of the formula



wherein n equals 1 or 2 and R′ can be hydrogen or a hydrocarbyl radical having from 1 to 6 carbon atoms.

4,256,904
REACTIVE LIQUID POLYMERS

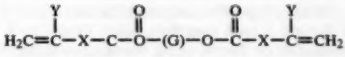
Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 6, 1979, Ser. No. 73,160

Int. Cl.³ C08G *65/24*

U.S. Cl. 560—104 **18 Claims**

1. A terminally unsaturated liquid epihalohydrin polymer having the formula



wherein Y is hydrogen or methyl, x is zero, alkylene or arylene and G is a polymeric backbone obtained by homopolymerizing an epihalohydrin or copolymerizing at least one epihalohydrin with at least one other 1,2-epoxide.

4,256,905
19-HYDROXY-19-METHYL-6A-CARBA-PGI$_2$ COMPOUNDS

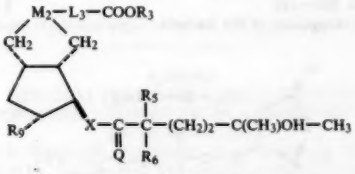
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,461

Int. Cl.³ C07C *59/11*

U.S. Cl. 560—119 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein L_3 is

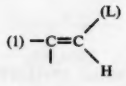
(1) $—(CH_2)_n—$, wherein n is one to 5, inclusive,

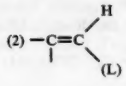
(2) $—(CH_2)_p—CF_2—$, wherein p is 2, 3, or 4,

or

(3) $—CH_2—CH=CH—$;

wherein M_2 is





wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4β-OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{16},
wherein —(Ph)— is inter-phenylene and —(p—Ph) is inter-para-phenylene or para-phenyl;
wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein R_9 is hydrogen or hydroxyl; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

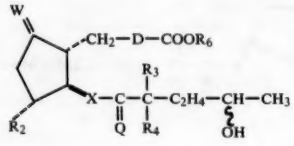
4,256,906

19-HYDROXY-TRANS-2,3-DIDEHYDRO-PG$_1$ COMPOUNDS

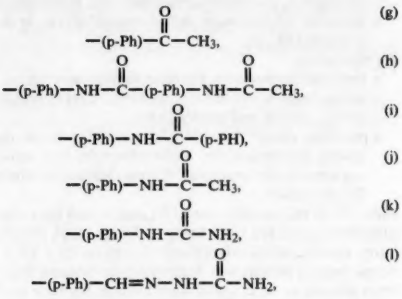
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 025,899, Apr. 2, 1979, Pat. No. 4,228,104. This application Oct. 26, 1979, Ser. No. 88,749
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 560—121 **2 Claims**

1. A compound of the formula



wherein D is trans—$(CH_2)_3$—CH=CH—,
wherein Q is α-OH:β-R_5 or α-R_5:β-OH,
wherein R_5 is hydrogen or methyl,
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;



(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein —(p—Ph)— is para-phenyl or inter-para-phenylene, and R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is oxo, methylene, α-OH:β-H, or α-H:β-OH; and wherein X is cis- or trans—CH=CH—, or —C≡C—.

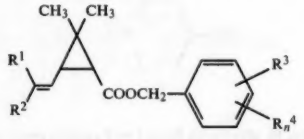
4,256,907

PREPARATION OF SUBSTITUTED VINYLCYCLOPROPANE-CARBOXYLIC ACID ESTERS

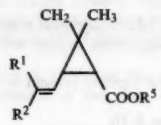
Klaus Naumann, Cologne; Rüdiger Schubart, Berg.-Gladbach, and Thomas Schmidt, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,664
Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721185
Int. Cl.^{3} C07C *67/10*
U.S. Cl. 560—124 **18 Claims**

1. A process for the preparation of a substituted vinylcyclopropanecarboxylic acid ester of the formula



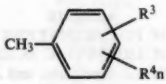
in which
R^1 and R^2 each independently is alkyl with 1–4 carbon atoms or halogen,
R^3 is halogen, phenoxy or phenoxy substituted by alkyl with 1–4 carbon atoms or by halogen,
R^4 is halogen or methyl, and
n is 0, 1, 2, 3 or 4,
comprising saponifying with alkali an ester of the formula



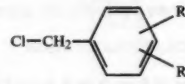
in which

R^5 is alkyl with 1–4 carbon atoms,

thereby to replace R^5 by an alkaline salt group, photochlorinating a compound of the formula



by reacting it directly in the gas phase at a temperature above about 200° C. with chlorine gas diluted with an inert gas to produce a benzyl chloride of the formula



and directly reacting such salt and said benzyl chloride without intermediate purification.

4,256,908

PROCESS FOR PREPARING DIESTERS OF MALONIC ACID

Kenji Nishimura; Shinichi Furusaki; Yasushi Shiomi; Kozo Fujii; Keigo Nishihira, and Masayoshi Yamashita, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jun. 21, 1979, Ser. No. 50,762

Claims priority, application Japan, Jul. 3, 1978, 53-79802; Dec. 6, 1978, 53-150018

Int. Cl.³ C07C *67/36, 67/38, 69/38*

U.S. Cl. 560—204 **7 Claims**

1. A process for preparing a diester of malonic acid which comprises reacting ketene and carbon monoxide with an ester of nitrous acid catalytically in the presence of metallic palladium or a salt thereof in (i) a gaseous phase at a temperature ranging from 80° to 150° C. or (ii) in a liquid phase at a temperature ranging from room temperature to 200° C., said ester being selected from esters of nitrous acid with saturated monovalent aliphatic or alicyclic alcohols having 1–8 carbon atoms.

4,256,909

PREPARATION OF DIMETHYL BUTANEDICARBOXYLATES

Rudolf Kummer, Frankenthal; Heinz-Walter Schneider, Ludwigshafen; Franz-Josef Weiss, Weinheim, and Otto Lemann, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,552

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837815

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—204 **5 Claims**

1. In a process for the preaparation of dimethyl butanedicarboxylates, wherein

(a) butadiene or a hydrocarbon mixture containing butadiene is reacted with carbon monoxide and methanol in the presence of a tertiary nitrogen base and a cobalt carbonyl catalyst at from 80° to 150° C. under superatmospheric pressure,

(b) the greater part of the tertiary nitrogen base and any excess hydrocarbons are removed and

(c) the methyl pentenoate thus obtained is reacted with carbon monoxide and methanol, in the presence of a cobalt carbonyl catalyst and the residual amount of tertiary nitrogen base, at from 140° to 200° C. under superatmospheric pressure, to give the dimethyl butanedicarboxylate, the improvement that the reaction mixture obtained in stage (a) after reaction of the butadiene is cooled until it separates into two phases, and a part-stream of from 20 to 80% by volume of the lower phase is recycled to stage (a).

4,256,910

LIQUID REACTIVE POLYMERS

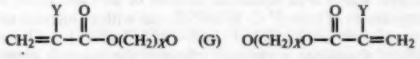
Chin C. Hsu, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 6, 1979, Ser. No. 73,161

Int. Cl.³ C08G *65/24*

U.S. Cl. 560—209 **19 Claims**

1. A terminally unsaturated liquid epihalohydrin polymer having the formula



wherein Y is hydrogen or methyl, X is 2 to 10 and G is a polymeric backbone obtained by homopolymerizing an epihalohydrin, copolymerizing two or more epihalohydrins, or copolymerizing an epihalohydrin with a vicinal epoxide.

4,256,911

16-SUBSTITUTED PROSTAGLANDIN INTERMEDIATE

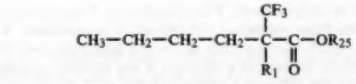
George W. Holland, North Caldwell; Jane L. Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 50,267, Jun. 19, 1979, which is a division of Ser. No. 847,881, Nov. 2, 1077, Pat. No. 4,187,381, which is a continuation-in-part of Ser. No. 745,257, Dec. 8, 1976, Pat. No. 4,112,225, which is a continuation-in-part of Ser. No. 683,576, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 430,458, Jul. 18, 1974, Pat. No. 4,052,446, which is a continuation-in-part of Ser. No. 386,117, Aug. 1, 1973, abandoned. This application Jun. 9, 1980, Ser. No. 158,043

Int. Cl.³ C07C *69/63*

U.S. Cl. 560—227 **1 Claim**

1. A compound of the formula



wherein R_1 lower alkyl or fluoro and R_{25} is lower alkyl.

4,256,912

REMOVAL OF SOLUBLE TELLURIUM OR COMPOUNDS THEREOF FROM A CRUDE GLYCOL ESTER SOLUTION

Alfred A. Wolsky, Ft. Washington; Richard B. Papp, Norwood, both of Pa., and James G. Victor, Haddonfield, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 9, 1979, Ser. No. 82,833

Int. Cl.³ C07C *67/56, 69/08, 69/16, 69/28*

U.S. Cl. 560—248 **7 Claims**

1. A method for the removal of soluble tellurium or compounds thereof from tellurium-containing vicinal glycol ester solutions derived from the tellurium catalyzed liquid phase reaction of an olefin, molecular oxygen and an aliphatic monocarboxylic acid in the presence of a halide ion source which comprises the steps of:

diluting the tellurium-containing vicinal glycol ester solution with at least about 50 percent by weight water;

contacting the dilute water-tellurium-containing glycol ester solution at a temperature in the range of about 15° C. to 95° C. with a strongly acidic sulfonated ion exchange resin to retain and remove tellurium or compounds thereof from said dilute glycol ester solution; and

recovering an essentially tellurium-free vicinal glycol ester solution.

4,256,913

PREPARATION OF CARBOXYLIC ACIDS USING A BF_3 CATALYST COMPLEX

John A. Jung, East Hanover, N.J., and Jimmy Peress, West Haven, Conn., assignors to Chem Systems Inc., New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,460
Int. Cl.³ C07C *51/14, 51/377, 53/122, 53/124*
U.S. Cl. 562—521 **5 Claims**

1. A process for the carbonylation of an olefin selected from the group consisting of ethylene and propylene which comprises: reacting said olefin with carbon monoxide in a liquid catalyst which is an equimolar amount of BF_3 and water at a temperature of from 0° C. to 100° C. and with an internal mole ratio of carbon monoxide to olefin of at least 5:1 until about 50% of the water is reacted, whereby the reaction product obtained is BF_3-water and a carboxylic acid containing one more carbon atom than the olefin employed in a molar ratio of approximately 2:1:1.

4,256,914

CATALYTIC OXIDATION OF METHACROLEIN

Sumio Umemura; Kyoji Ohdan; Fumihiko Sakai; Kenichi Suzuki; Toshihiko Hogami, and Masataka Fuginaga, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 17, 1979, Ser. No. 68,198
Claims priority, application Japan, Aug. 25, 1978, 53-102748
Int. Cl.³ C07C *51/25, 57/055*
U.S. Cl. 562—535 **11 Claims**

1. An improvement in the process for the preparation of methacrylic acid by catalytically oxidizing methacrolein in the vapor phase with molecular oxygen at a temperature of from 200° C. to 450° C., said improvement comprising using a catalyst consisting essentially of (A) molybdenum, (B) phosphorus, (C) potassium and/or cesium, (D) vanadium, (E) silver and/or tellurium and (F) oxygen and represented by the formula:

$$Mo_{12}P_aA_bV_cX_dO_e$$

wherein Mo is molybdenum, P is phosphorus, A is at least one metal selected from potassium and cesium, V is vanadium, X is at least one metal selected from silver and tellurium, and O is oxygen, and the subscripts a through d are positive numbers falling within the following ranges: a=0.5 to 5, b=0.1 to 4, c=0.05 to 3 and d=0.001 to 2, and e is a positive number required by the valence states of the other elements present.

4,256,915

PRODUCTION OF ETHYLENICALLY UNSATURATED ALIPHATIC ACIDS

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford, both of Ohio, assignors to Standard Oil Company, Ohio

Filed Dec. 26, 1979, Ser. No. 106,787
Int. Cl.³ C07C *51/25, 57/055*
U.S. Cl. 562—535 **5 Claims**

1. The process for the production of olefinically unsaturated aliphatic acids by vapor phase catalytic oxidation of corresponding olefinically unsaturated aliphatic aldehydes with molecular oxygen, said reaction occurring over an oxidation catalyst represented by the following formula:

$$Mo_aV_bRe_cX_dO_e$$

wherein

X is one or more of the elements selected from the group consisting of magnesium, copper and cadmium, and

wherein

the number of each element present is represented by a–d;

wherein

a is a number from 8–16;

b is a number from 0.5 to 5;

c is a number from 0.01 to 5;

d is a number from 0.01 to 5; and

e is a number that satisfies the valence requirements of the other elements present.

4,256,916

OXIDATION OF POLYETHYLENE GLYCOLS TO DICARBOXYLIC ACIDS

Don L. Morris; William J. Gammans, and Jerry D. Holmes, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 862,068, Dec. 19, 1979, abandoned. This application Aug. 15, 1979, Ser. No. 66,759
Int. Cl.³ C07C *17/26*
U.S. Cl. 562—537 **8 Claims**

1. In a process whereby a polyethylene glycol of the formula

$$HOCH_2CH_2O(CH_2CH_2O)_nCH_2CH_2OH$$

where n is an integer of from 0 to 5, is oxidized directly to a dicarboxylic acid having the formula

$$HOOCCH_2O(CH_2CH_2O)_nCH_2COOH$$

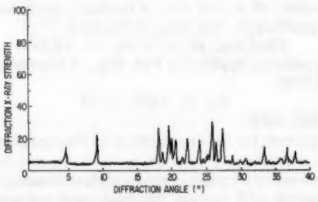
wherein n is as previously defined, in the presence of a platinum catalyst selected from the group consisting of finely divided platinum and platinum supported on carbon and an oxidizing gas, the improvement resulting from passing the reactants over a fixed bed catalyst consisting of platinum deposited on granular carbon at a reactant velocity over the catalyst surface of from about 0.1 to about 0.6 feet per second and a partial pressure of oxygen of from about 30 to about 150 psig.

4,256,917

ANHYDROUS L-LYSINE MONOHYDROCHLORIDE IN α-CYRSTALLINE FORM AND PREPARATION THEREOF

Yoshikazu Takayanagi, Yokohama; Katsuo Iizumi, Kawasaki; Masashi Miyazawa, Yokohama; Nobuyuki Yamaya, Kawasaki, and Hajime Tamura, Sagamihara, all of Japan, assignors to Ajinomoto Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 583,527, Jun. 4, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,283
Claims priority, application Japan, Jun. 4, 1974, 49/63137
Int. Cl.³ C07C *101/24*
U.S. Cl. 562—562 **4 Claims**



1. Anhydrous L-lysine monohydrochloride crystals having the X-ray diffraction pattern of FIG. 1.

4,256,918

ELECTRODE FOR ARC FURNACES

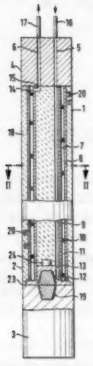
William E. Schwabe, Parma Heights, Ohio; Emil Elsner, and Rudolph Kasper, both of Baden-Baden, Fed. Rep. of Germany, assignors to Korf-Stahl AG, Baden-Baden, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,051

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1977, 2725537

Int. Cl.[3] H05B 7/06

U.S. Cl. 13—11 18 Claims



1. Electrode for electric arc furnaces, in particular for production of iron and steel, comprising: a liquid-cooled upper portion adapted to be inserted into an electrode holder, a lower portion forming an electrode tip and being detachably fastened to said upper portion, said detachable electrode tip being a consumable member, said upper portion including a conduit system for cooling liquid protected by a fire-proof material, said conduit system being adapted to conduct electric current to the electrode tip, a nipple fastening said electrode tip to said upper portion, and means for producing a magnetic field and for causing the arc on the electrode tip to move, said means being disposed in the lower part of the upper portion of the electrode.

4,256,919

TEMPERATURE CONFINING DEVICES AND METHOD

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corp., Buckfield, Me.

Continuation-in-part of Ser. No. 898,289, Apr. 20, 1978, abandoned, and a continuation-in-part of Ser. No. 934,025, Aug. 16, 1978, abandoned. This application Feb. 9, 1979, Ser. No. 10,712

Int. Cl.[3] F27D 11/04, 11/06, 9/00

U.S. Cl. 13—23 42 Claims

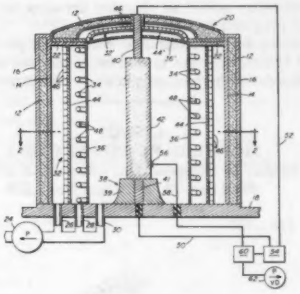
1. An energy efficient apparatus for varying the temperature of a metallic workpiece, said apparatus comprising:

a housing including a vacuum seal,

a workpiece support within the housing,

means for evacuating the interior of the housing,

an infrared reflective envelope within the housing disposed to reflect radiation emitted from a hot workpiece on said support back to the workpiece, said envelope comprising an infrared reflective surface and means for dissipating heat, and



means for heating a workpiece located on said workpiece support.

4,256,920

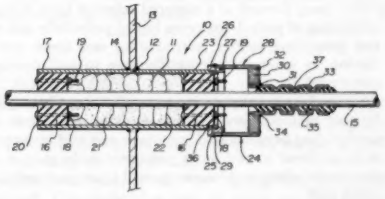
RE-ENTERABLE DUCT SEAL

Rand K. Ayres, and Hassan A. Sherif, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 18, 1979, Ser. No. 31,309

Int. Cl.[3] H02G 3/22

U.S. Cl. 174—65 R 20 Claims



1. A re-entrable duct through which a cable is adapted to penetrate a wall, said wall having an aperture therethrough, said duct comprising:

(a) a duct pipe through which said cable is adapted to pass, said duct pipe being adapted to be secured within said aperture in said wall;

(b) a resilient split rubber duct plug disposed at each end of said duct pipe, said cable being adapted to pass through a central aperture in each of said split rubber duct plugs, each of said split rubber plugs being provided with manually operable means to act on said central aperture, whereby each said central aperture is adapted hermetrically sealingly and circumferentially to engage said cable, said annular plugs and said duct pipe defining a primary sealant chamber therebetween;

(c) a quantity of bentonite substantially filling said primary sealant chamber and adapted to surround said cable;

(d) a sleeve secured to one end of said duct pipe adjacent one said split rubber duct plug, said sleeve including an end plate having a central aperture therethrough through

which said cable is adapted to pass, said cable being adapted to be secured within said central aperture in a circumferential hermetic sealed manner, thereby defining a secondary sealed air chamber between said split rubber duct plug and said end plate; and

(e) a crimpable tube disposed within, and projecting from, said central aperture in said end plate, and adapted to be crimped into hermetically sealed contact onto said cable.

4,256,921

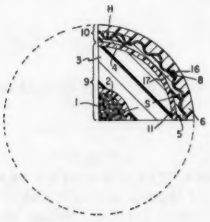
MOISTURE RESISTANT CABLE

George Bahder, 24 Highpoint Dr., Edison, N.J. 08817

Filed Jan. 22, 1979, Ser. No. 5,320

Int. Cl.[3] H01B *7/28*

U.S. Cl. 174—107 10 Claims



1. A moisture resistant electrical cable comprising:

a cable core including a conductor and a body of insulating material surrounding said conductor, and

a composite cable jacket surrounding said core including,

an inner part surrounding said core and having a corrugated outer surface wherein said corrugations form spirals having an axis substantially coextensive with the axis of said cable and a lay length of at least approximately one foot,

an outer part, formed of a material selected from the group consisting of polyolefin, cross linked polyolefin and ethylene propylene rubber, surrounding said inner part and having an inner surface conforming to said corrugated outer surface,

a moisture barrier comprising a metallic sheet having overlapping end portions forming a seam, said sheet being sandwiched between said inner part and said outer part so as to conform to said inner and outer surface,

means for bonding said barrier to said inner part and to said outer part,

and means for bonding said end portions to each other;

wherein a factor of H·n/s of said barrier is greater than 0.12 at room temperature: where

S is the circumference of said jacket at the center of said corrugations,

H is the difference in length between a radius from the center of said cable to a peak of one of said corrugations and a radius from said cable center to a valley of one of said corrugations, and

n is the number of said corrugations counted in a circumferential direction.

4,256,922

STEREOPHONIC EFFECT SPEAKER ARRANGEMENT

Rudolf Görike, Sternwartstrasse 57c, Vienna 18, Austria

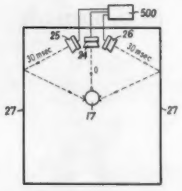
Filed Mar. 15, 1979, Ser. No. 20,713

Claims priority, application Austria, Mar. 16, 1978, 1870/78; May 8, 1978, 3315/78

Int. Cl.[3] H04S *1/00*

U.S. Cl. 179—1 GA 14 Claims

3. A loudspeaker arrangement for reproducing acoustic events of the type transmitted through at least two channels in a room having sound reflecting sidewalls comprising a housing; loudspeaker means mounted in said housing for radiating sound from said housing in at least two directions; said loudspeaker means having at least one loudspeaker for each channel transmitting the acoustic events to be reproduced and for reproducing middle and high range frequencies in the acoustic events to be reproduced being positioned to laterally radiate sound toward one of the sidewalls to cause the sound to be reflected off the sidewall and delay its reaching a listener in the



room, and a loudspeaker positioned to radiate sound forwardly; means for controlling the amplitude or frequency response of the loudspeaker of each channel; and delay means operative for delaying the sound radiated from each loudspeaker positioned to laterally radiate sound with respect to sound radiating from said loudspeaker positioned to radiate sound forwardly.

4,256,923

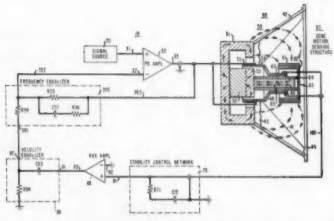
SOUND REPRODUCING SYSTEM UTILIZING MOTIONAL FEEDBACK AND INTEGRATED MAGNETIC STRUCTURE

Stanley T. Meyers, 122 N. Riverside Ave., Red Bank, N.J. 07701

Filed Aug. 17, 1979, Ser. No. 67,516

Int. Cl.[3] H04R *3/00*

U.S. Cl. 179—1 F 27 Claims



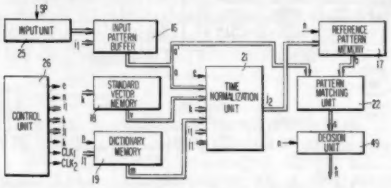
1. Means for sensing the motion of the sound producing member driven by the main electromagnetic structure of a loud speaker wherein said main electromagnetic structure exhibits a stray magnetic field, said motion sensing means comprising: first and second iron members being responsive to said stray magnetic field for forming a magnetic field path respectively to and from said main electromagnetic structure, and said first and second iron members forming a gap including said magnetic field path; and

feedback means being fixedly attached to said sound producing member and moving uniformly therewith and being located within said gap for sensing the motion of said sound producing member and for producing a motional feedback signal.

4,256,924
DEVICE FOR RECOGNIZING AN INPUT PATTERN WITH APPROXIMATE PATTERNS USED FOR REFERENCE PATTERNS ON MAPPING

Hiroaki Sakoe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1979, Ser. No. 95,263
Claims priority, application Japan, Nov. 22, 1978, 53-144428
Int. Cl.[3] G10L *1/00*
U.S. Cl. 179—1 SD **2 Claims**



1. A pattern recognition device for recognizing an input pattern by calculating similarity measures between said input pattern and a predetermined number of reference patterns, said device comprising:

input pattern buffer means for memorizing a time sequence of input pattern feature vectors $a_i(i=1, 2, \ldots, I)$ representative of said input pattern;

reference pattern memory means for memorizing time sequences of reference pattern feature vectors $b^n_j(n=1, 2, \ldots, N; j=1, 2, \ldots, J^n)$ representative of the respective reference patterns;

standard vector memory means for memorizing standard vectors $v_m(m=1, 2, \ldots, F)$ preselected in consideration of the reference pattern feature vectors b^n_j;

dictionary memory means for memorizing a dictionary given by suffixes $m^n(j)$ for identifying selected ones $v_{m^n(j)}$ of said standard vectors v_m, said selected standard vectors $v_{m^n(j)}$ being those of said standard vectors v_m which are most similar to the reference pattern feature vectors b^n_j of the respective reference patterns;

time normalizing means for finding a mapping function $j=j(i)$ for carrying out time normalization between said input pattern and each of said reference patterns by minimizing as a whole the difference between said input pattern feature vectors a_i and the standard vectors $v_{m(j)}$ specified by said dictionary for each said reference pattern; and

pattern matching means for carrying out pattern matching between said input pattern and said each reference pattern based on the mapping function $j=j(i)$ to derive a similarity measure between said input pattern and said each reference pattern.

4,256,925
CAPACITY REALLOCATION METHOD AND APPARATUS FOR A TDMA SATELLITE COMMUNICATION NETWORK WITH DEMAND ASSIGNMENT OF CHANNELS

Burwell Goode, Falls Church, Va., assignor to Satellite Business Systems, McLean, Va.

Filed Dec. 12, 1978, Ser. No. 968,720
Int. Cl.[2] H04J *6/02*
U.S. Cl. 370—104 **28 Claims**

1. A method of demand allocating communications channels among a plurality of stations communicating with one another through a transponder in earth orbit in a TDMA communications system, comprising the steps of:

receiving channel capacity requests from a plurality of said stations;

initiating a reallocation of the channel capacity assignments of said stations when the total capacity request of at least one station exceeds a corresponding threshold channel capacity for the station, the steps for reallocating including,

defining a particular channel capacity request for each station that includes the capacity request for at least one class of channels of the station,

defining an exces capacity allocation factor for each of said stations that is a nonlinear function of said particular channel capacity request of the station,

defining an excess capacity amount for said communication system by subtracting the sum of the capacity requests of

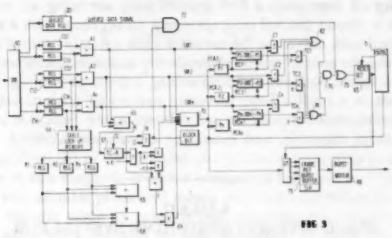


FIG 3

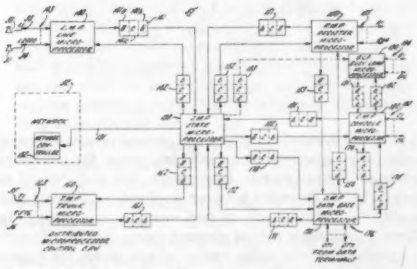
the stations and a minimum system channel allocation from the total channel capacity of the system, and

allocating to each of said stations a number of channels that is at least equal to the sum of the corresponding capacity request of the station, an additional minimum station channel allocation, and a portion of said excess capacity amount that is defined by the ratio of said excess capacity allocation factor of the station to the sum of the excess capacity allocation factors of all of the stations; and transmitting data including the reallocated channel capacity assignments to said stations.

4,256,926
MICROPROCESSOR CONTROL COMPLEX FOR A TELECOMMUNICATION SWITCHING SYSTEM

Satyan G. Pitroda, Villa Park; William A. Fechalos, Naperville, and Carl J. Stehman, LaGrange, all of Ill., assignors to Wescom Switching, Inc., Oakbrook, Ill.

Continuation-in-part of Ser. No. 734,732, Oct. 21, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,091
Int. Cl.[3] G06F *15/16;* **H04M** *3/22;* **H04Q** *11/04*
U.S. Cl. 179—18 ES **62 Claims**



20. In a microprocessor controlled switching exchange, the improvement comprising a plurality of asynchronously operating microprocessor control units each having a microprocesor, individual memory means for each microprocessor programmed to distribute the functions of the switching exchange among said control units, the programs in the respective memory means differing one from the other and constructed so that all of the functions of the switching system are sectioned along functional call processing lines and the functions so sectioned

are assigned to respective ones of the microprocessor control units, means for intercommunicating between pairs of the control units to coordinate performance of the functions of the switching exchange, and said means for intercommunicating comprising interprocessor buffer means connected between and dedicated solely to communication between pairs of said control units for providing dedicated communication paths between said pairs of control units.

42. A method of controlling a telephone switching system having a plurality of lines and trunks, registers for collecting dialed information and a digital switching network for completing connections, said method comprising the steps of servicing all lines with a first control unit, servicing all trunks with a second control unit, servicing all registers with a third control unit, servicing the network with a fourth control unit, driving the control units independently to continuously service the assigned portions of the switching system, producing commands as a result of the servicing operation, communicating the commands between the control units along dedicated asynchronous channels, and executing commands received in a control unit.

4,256,927

SPACE DIVISION SWITCHING SYSTEM FOR COMMUNICATION NETWORKS USING OPTICAL SIGNAL FREQUENCIES

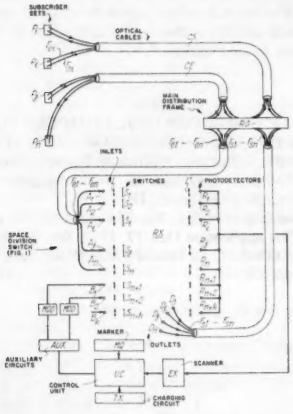
Michel E. Treheux, An Tri Breud, rue des Iles-l'Ille Grande, 22560 Plemeur-Bodou, and Rene J. Lacroix, Rue Ampere, 22700 Perros-Guirec, both of France

Filed Apr. 18, 1979, Ser. No. 31,132

Claims priority, application France, Apr. 21, 1978, 78 12862

Int. Cl.[3] **G02B** *5/32;* **H04B** *9/00;* **H04M** *1/00;* **H04Q** *3/48*

U.S. Cl. 179—18 E **9 Claims**



1. A space-division switching and control system comprising a network of space-division switching means for information modulated optical carrier frequencies, the switches of said network being arranged between a plurality of inlets and a plurality of outlets, each of said switches comprising light deflection restorable optical element means capable of recording a plurality of restorable optical arrays, means for associating each of said switches with an inlet from which it receives impinging light waves, means responsive to each optical array in each switch for deflecting impinging light waves along a direction which is different for an O-order direction toward a selected outlet among the plurality of outlets, and photodetector means in the O-order direction of each switch for giving output signals which indicate the lit or unlit condition of the associated inlet, said output signals being transmitted to a switching control means associated with the space-division switching and control system.

4,256,928

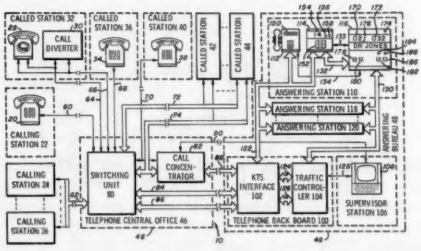
TELEPHONE CALL DIVERTING AND ANSWERING SYSTEM

Ronald A. Lesea, Rodeo; Barrie Luttge, Fremont, and Austin H. Lesea, Richmond, all of Calif., assignors to Durango Systems, Inc., San Jose, Calif.

Filed Sep. 28, 1979, Ser. No. 80,169

Int. Cl.[3] **H04M** *3/54*

U.S. Cl. 179—18 BE **11 Claims**



1. An apparatus for coupling calls on a first plurality of lines to a second plurality of lines to each of which each of a third plurality of telephone sets may be connected, the apparatus comprising in combination:

a telephone call concentrator including, first line interface means for connection to each of said first plurality of lines, said first line interface means having first line ringing signal detector means responsive to a ringing signal generator on an active one of said first lines and operative to generate a ringing detected signal, second line interface means for connection to each of said second plurality of lines, said second line interface means having ringing signal generator means responsive to a ring command signal designating a one of said second plurality of lines and operative to generate a ringing signal thereon, off-hook detector means responsive to an off-hook signal generated on said designated line and operative to generate an off-hook line identifying signal, calling line identifying signal generator means responsive to an identify command signal and operative to develop an active line identifying signal on said designated line, and connect signal detector means responsive to a connect signal developed on said designated line and operative to generate a connect signal detected signal and bridge means for connection to each of said first and said second plurality of lines, said bridge means being responsive to a bridge command signal and operative to bridge said active line to said designated line, said concentrator being responsive to said ringing detected signal and operative to select an idle one of said second plurality of lines and to generate said ring command signal, whereby said ringing signal is generated on said selected line, said concentrator being further responsive to said off-hook line identifying signal and operative, when the line identified by said off-hook line identifying signal and said selected line are the same, to generate said identify command signal, and responsive to said connect signal detected signal and operative to generate said bridge command;

a plurality of operator consoles equal in number to said sets, each set console including, set interface means for coupling to an associated one of said plurality of sets, said set interface means having set status detecting means responsive to the tip to ring current conducted by said associated set and operative to generate a set status signal and annunciator means responsive to a display signal and operative to designate a line; and

controller means coupled to each of said operator consoles, said controller means including controller line interface means for coupling to each of said second plurality of

lines, said controller line interface means having second line ringing signal detector means responsive to said ringing signal generated on said selected line and operative to generate a selected line identifying signal, off-hook signal generator means responsive to an off-hook command signal and operative to generate said off-hook signal on said selected line, and active line identifying signal detector means for receiving said active line identifying signal, said controller means being responsive to said selected line identifying signal and operative to generate said off-hook command signal, responsive to said active line identifying signal detected by said active line identifying signal detector means and each of said set status signals and operative to select an idle one of said consoles and to generate said display signal, whereby said selected line and said active line are designated at said selected console.

4,256,929

TELEPHONE SET WITH STORING BOX

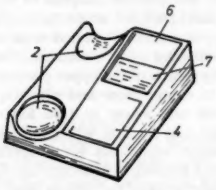
Knut H. Blomberg, Lokattsvägen 39, S-161 37 Bromma, Sweden

Filed May 21, 1979, Ser. No. 40,707

Claims priority, application Sweden, Jun. 9, 1978, 7806703

Int. Cl.³ H04M *1/02, 1/21*

U.S. Cl. 179—100 D **10 Claims**



1. A telephone set comprising a hollow housing containing telephone communication equipment including circuit board means, said housing including a cover, said circuit board means having a connector portion adapted for insertion of supplementary telephone circuit modules connectable with said telephone communication equipment, said cover having an opening through which said modules can be inserted for operative connection with said connector portion, and a box adapted to fit in said opening when the latter is unoccupied by one of said supplementary modules, said box being supported by said housing to separate a user of the telephone set from said connector portion when fitted into said opening, and means in said box for providing informational aid to said user separate and apart from the functional operation of the telephone set but adapted to assist said user in a supplementary fashion, said informational aid means being acessible through said opening in said cover.

4,256,930

LOUDSPEAKER HAVING IMPROVED MAGNETIC ASSEMBLY

Alex V. Garner, High Wycombe, and Graham Townsend, Chinnor, both of England, assignors to Tannoy Products Limited, High Wycombe, England

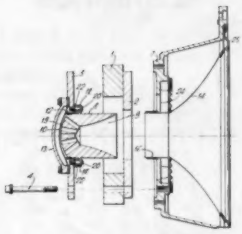
Filed Jan. 29, 1979, Ser. No. 7,376

Claims priority, application United Kingdom, Feb. 22, 1978, 7108/78

Int. Cl.³ H04R *11/02*

U.S. Cl. 179—116 **3 Claims**

1. In a moving coil loudspeaker of the type including a magnetic assembly comprising a ring magnet, front and rear annular magnetic plates fitted at the ends of said ring magnet and a central magnetic pole piece formed with an axial passage defining a horn, said pole piece extending into the openings in said annular plates to define first and second axially spaced annular air gaps in series with one another, first and second co-axial speech coils, said speech coils operating in said respective air gaps, a cone driven by said first speech coil, and a high frequency diaphragm driven by said second speech coil to provide acoustic output to said horn, the improvement comprising said central pole piece being formed with an encircling



flange forward of its rear end and proximate the rear annular plate, a non-magnetic member interposed between said flange and rear annular plate, and means securing said flange to said rear annular plate by way of said non-magnetic member to constitute the sole fixing for said pole piece.

4,256,931

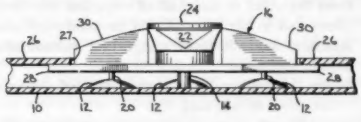
MULTIPLE DOME SWITCH ASSEMBLY HAVING PIVOTABLE COMMON ACTUATOR

William F. Palisek, Mundelein, Ill., assignor to Interstate Industries, Inc., Mundelein, Ill.

Filed Aug. 27, 1979, Ser. No. 69,904

Int. Cl.³ H01H *13/70, 25/00*

U.S. Cl. 200—5 A **6 Claims**



1. A switch assembly comprising:

a support surface;

a plurality of resilient dome momentary contact switches mounted on the support surface and arranged generally about the circumference of a circle;

a key, and means for pivotally supporting said key above said support surface from a central portion of said circle and for maintaining the key centrally located during pivoting, said key being supported generally at its center by said pivotally supporting means whereby said key can be pivoted about its center, said key having force applying regions extending radially outwardly from its center and over an associated switch; and

a plurality of switch engaging members located on said key force applying portions, each switch engaging member extending over an associated switch in contact therewith, and said switches being disposed in force equalizing relationship with respect to said switch engaging members and each switch engaging member being normally biased to a neutral position by the resilient dome of the associated switch whereby, when force is applied to a force applying region of said key anywhere along a radial line extending from the center of the key through a point generally over a switch, the key pivots and carries a switch engaging member from its neutral position to deform the resilient dome of the associated switch to actuate that switch, and, when the force is removed, that switch dome assumes its normal undeformed condition to move the switch engaging member back to its neutral position.

4,256,932

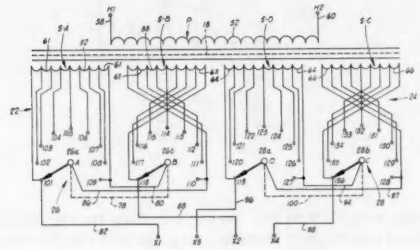
ROTARY SWITCH

Donald W. Owen, 334 Foreman Ave., Norman, Okla. 73069

Division of Ser. No. 795,754, May 11, 1977, Pat. No. 4,160,224, which is a continuation-in-part of Ser. No. 646,185, Jan. 2, 1976, abandoned. This application Dec. 26, 1978, Ser. No. 973,140

Int. Cl.[3] H01H *19/58*

U.S. Cl. 200—11 TC 27 Claims



1. A compound tandem rotary switch for selectively concurrently interconnecting multiple sections of two pairs of tapped electrical conductors having leads extending from each conductor at opposite ends of the multiple sections thereof, said switch comprising:

a pair of terminal supporting subassemblies each having spaced connecting situses thereon for physically connecting a plurality of said leads thereto from each of said electrical conductors in one pair of said conductors, with the leads of one pair of conductors being connected to one of said terminal supporting subassemblies, and the leads from the other of said pair of electrical conductors being connected to the other of said terminal supporting subassemblies, said terminal supporting subassemblies each further including:

means for electrically insulating each of said situses from the other situses; and

means for retaining a pair of common electrically conductive elements in spaced positions in which each of said common electrically conductive elements extends between one of said situses and a wiper contacting position remote from said one situs;

a pair of electrically conductive movable wiper means adjacent each of said terminal supporting subassemblies, and each having a portion thereof located at one of said wiper contacting positions for contact with a common electrically conductive element;

means for electrically insulating the electrically conductive movable wiper means in each pair of said wiper means from each other;

means for concurrently moving the electrically conductive movable wiper means in each pair of said movable wiper means in consecutive sequence between said connecting situses of the respective terminal supporting subassembly associated with the respective pair of electrically conductive movable wiper means; and

means for physically interconnecting said terminal supporting subassemblies to each other to position and orient the connecting situses of each terminal supporting subassembly at locations such that leads from each of said tapped electrical conductors, and at opposite ends of each of the multiple sections thereof, will extend substantially parallel to and be spaced from leads from each of the other electrical conductors, and at the respective opposite ends of respective multiple sections thereof, when said leads are connected to the connecting situses of said terminal supporting subassemblies.

4,256,933

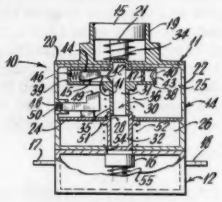
SWITCHING DEVICE FOR PREVENTING PROLONGED ELECTRICAL CONTACT

Pil Y. Choe, Dunellen, N.J., assignor to Man Bo Inc., Dunellen, N.J.

Filed Aug. 8, 1979, Ser. No. 64,543

Int. Cl.[3] H01H *7/03*

U.S. Cl. 200—34 12 Claims



1. A device for preventing prolonged depression-action type activation comprising: a housing; a depressible plunger mounted in said housing having an upper portion and a lower portion, said lower portion being movable with respect to said upper portion, said plunger adapted to be filled with air and having an air inlet port and an air outlet port; means including operable stopper means associated with said outlet port for normally maintaining same closed and being operatively responsive to depression of the upper portion of said plunger for allowing air to escape from said plunger; first spring means associated with said lower portion for retracting same inwardly toward said housing when sufficient air has escaped from said plunger while said upper portion is depressed inwardly into said housing; and second spring means associated with said upper portion for urging said upper portion outwardly from said housing when no depression force is applied to said upper portion, with air being permitted to re-enter said plunger through said air inlet port when said stopper means closes said outlet port upon removal of the depression force from said upper portion.

4,256,934

DISCONNECTING SWITCH ARRANGEMENT

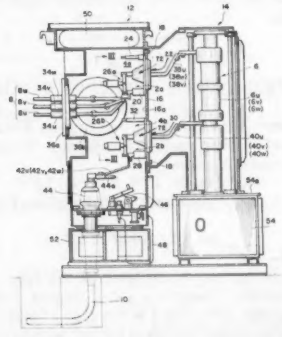
Teiji Nogi, Tokyo, and Takao Yasuda, Numazu, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 30, 1979, Ser. No. 62,141

Claims priority, application Japan, Aug. 4, 1978, 53-107853[U]; Aug. 10, 1978, 53-97564

Int. Cl.[3] H01H *31/00*

U.S. Cl. 200—48 R 10 Claims



1. A disconnecting switch arrangement comprising, in combination, at least one disconnecting unit consisting of a station-

ary contact member secured on an inner wall of a tank and terminating in an electrical conductor, a common stationary contact member secured on said inner wall of the tank and positioned spaced apart a predetermined distance from said stationary contact member and connected to an electrical machine, and a common movable contact member for connecting said stationary contact member and said common stationary contact member, at least one earthing unit for grounding said electrical machine and comprises said common stationary contact member, an earthing contact member fastened to the inner wall of said tank and spaced apart a predetermined distance from the common stationary contact member so as to be in alignment with said stationary contact member of the disconnecting unit and the common stationary contact member and said common movable contact member, and an actuating unit for moving in a circular movement said common movable contact member so as to be alternately and electrically connected with and disconnected from between said stationary contact member and said common stationary contact member in the disconnecting unit and between said earthing contact member and the common stationary contact member in the earthing unit, said actuating unit comprising at least one operating rod for mounting said common movable contact member, a first supporting member for supporting rotatably said operating rod, a second supporting member spaced apart a given distance with respect to the disconnecting unit and the earthing unit from said first supporting member and for supporting said operating rod together with the first supporting member and a driving member for moving in a circular motion said operating rod.

4,256,935

COAXIAL CABLE CONNECTOR RECEPTACLE

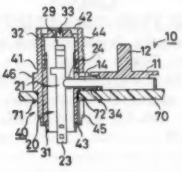
Katsuo Ito; Bunjiro Murata, both of Kanazawa; Kazunori Yoshimura, Nonoichi, and Kenichi Yamaguchi, Kanazawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 15, 1979, Ser. No. 66,579

Claims priority, application Japan, Aug. 22, 1978, 53-115569[U]; Aug. 22, 1978, 53-115570[U]

Int. Cl.³ H01R *13/70*

U.S. Cl. 200—51 R **32 Claims**



1. A coaxial cable connector receptacle for connection to a coaxial cable including a center conductor and an outer conductor and for connection to a contact of an external circuit other than said coaxial cable, comprising:

a cylindrical shield casing made of an electrically conductive material and having openings at both ends and having a first aperture formed at the side surface thereof;

an inner casing made of an insulating material being housed inside said shield casing, said inner casing having a second aperture formed therein corresponding to one of said openings of said shield casing and a third aperture formed therein at the side surface thereof and corresponding to said first aperture of said shield casing; and

a contact member made of an electrically conductive material and being housed in said inner casing, said contact member comprising a first contact formed at a position corresponding to said second aperture of said inner casing for direct or indirect connection to said center conductor of said coaxial cable, and a second contact formed at the position corresponding to said third aperture of said inner casing for connection to a contact extending from said external circuit through said first aperture of said shield casing and said third aperture of said inner casing;

said outer conductor of said coaxial cable being electrically connected directly or indirectly to said shield casing.

4,256,936

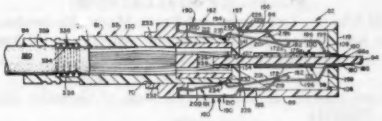
ELECTRICAL JACK AND PATCH CORD ASSEMBLIES

Jesse F. Lancaster, Great Falls, Va., assignor to Dynatech Laboratories, Inc., Alexandria, Va.

Continuation-in-part of Ser. No. 650,019, Jan. 18, 1976, Pat. No. 4,140,918, which is a continuation-in-part of Ser. No. 420,584, Nov. 30, 1973, abandoned. This application Oct. 27, 1978, Ser. No. 955,233

Int. Cl.³ H01R *19/50, 19/52*

U.S. Cl. 200—51.07 **24 Claims**



1. An electrical jack for use with a printed circuit board edge connector having a set of contact elements supported in an electrical insulating body, said electrical jack comprising means defining at least one socket for slidably receiving said connector, printed circuit board means having an end portion extending into said socket for reception in said edge connector upon manual insertion of said connector in said socket, and an electrical circuit comprising (a) printed circuit means disposed on said board means and having a set of first terminal portions and a set of second terminal portions and (b) switching means normally conditioned to cooperate with said printed circuit means for electrically connecting each of said first terminal portions to a different one of said second terminal portions, said printed circuit means having conductor means extending along said end portion of said board means for electrically connecting said contact elements to said first terminal portions upon insertion of said connector into said socket to a position where it receives said end portion, and said switching means extending in said socket and being actuatable by the reception of said connector in said socket to electrically disconnect said first terminal portions from said second terminal portions.

4,256,937

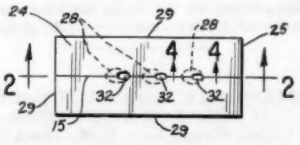
ELECTROMAGNETIC CONTACTOR ARC CHUTE

Frederick E. Woodlief, Lexington, and Gene E. DeAmicis, Greenville, both of S.C., assignors to Square D Company, Palatine, Ill.

Filed Jun. 16, 1978, Ser. No. 916,317

Int. Cl.³ H01H *33/02*

U.S. Cl. 200—144 R **4 Claims**



1. An arc chute for controlling, shaping and extinguishing an arc formed by the separation of the current carrying contact elements in a contactor which interrupts the current flowing between the contact elements, said arc producing heat and air pressures, the improvement comprising:

a pair of arc shielding side walls;

a front portion connected to the side walls and having an opening therethrough for passing the arc;

a rear portion connected to the side walls; and

a top wall connected to the front and rear portions as well as the side walls defining a chute chamber therewith, said top wall having a predetermined number and size of spaced apart and tapered holes therethrough extending in a line intermediate the side walls from the front to rear portions and angled toward the front portion for directing jets of air thereto to keep the arc from moving directly above the top wall and for splitting the arc into smaller voltage increments to make it easier to extinguish the same and to increase the upper limit of fault current interruptions.

4,256,938

ELECTRICAL CONTROL DEVICE FOR HIGH AND LOW VOLTAGE INSTALLATIONS

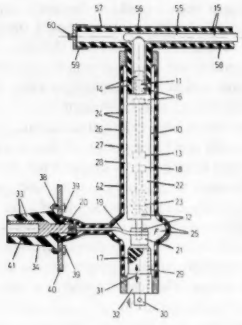
Arnold Efinger, Trossingen, and Erwin Moser, Karlsruhe-Rüppur, both of Fed. Rep. of Germany, assignors to Wickmann-Werke Böblingen GmbH, Bölingen, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,834

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 27398114

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **12 Claims**



1. In combination with an electrical control device for high and low voltage installations, which includes at least one switch having a stationary contact, a connecting part having said stationary contact connected thereto and connected to an insulated current supply line, said switch also having a movable counter contact, an insulating body connected to said movable counter contact and subjected to control movements; a cable connecting member; and a flexible inner electric conductor connected to said movable contact by way of said insulating body, the improvement of a joint electrically isolating envelope therewith comprising a bellows having at least one annular fold and collectively tightly encasing said switch, said cable connecting member, and said insulating body; said bellows having at least the one annular fold being operable to absorb control movements exerted upon said insulating body; said envelope having an electrically insulating inner layer and an electrically conductive outer layer for the ground potential.

4,256,939

MOVING CONTACT FOR LOCALIZED GAS FLOW ARC SPINNER TYPE INTERRUPTER

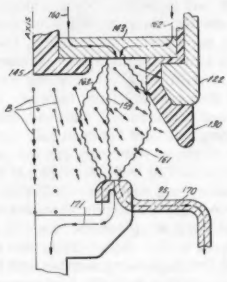
Ruben D. Garzon, Malvern; Lorne D. McConnell, Chalfont, and Gerald A. Votta, King of Prussia, all of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jan. 11, 1978, Ser. No. 868,621

Int. Cl.³ H01H *33/18*

U.S. Cl. 200—147 R **14 Claims**

1. A circuit interrupter comprising a stationary contact assembly; a movable contact assembly; a dielectric gas filled housing containing said stationary and movable contact assemblies; said stationary contact assembly including an arc runner contact and an electrical coil and circuit connection means for connecting said electrical coil in series with said arc runner contact; said arc runner contact comprising a generally flat conductive disk having an axis which is coaxial with the axis of said coil; said coil being disposed adjacent one surface of said arc runner contact and being in a plane parallel to the plane of said arc runner contact and being closely magnetically coupled to said arc runner contact to produce magnetic flus in the region adjacent the surface of said arc runner contact which is



opposite to said one surface to rotate a root of an arc around said arc runner contact to extinguish said arc; said movable contact assembly including a generally cylindrical arcing contact which is coaxial with said arc runner contact, and which is movable into and out of contact with said surface of said arc runner contact which is opposite to said one surface; and channel means disposed in the center of said arcing contact which leads to a relatively cool gas volume compared to the gas temperature in the arc region; said channel means communicating with said arc region and with said relatively cool gas volume, whereby an arc plasma tends to flow toward said relatively cool gas volume during arc interruption conditions.

4,256,940

GAS-BLAST TYPE CIRCUIT INTERRUPTER

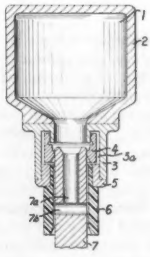
Masami Kii, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,519

Claims priority, application Japan, Mar. 24, 1977, 52-32941

Int. Cl.³ H01H *33/74*

U.S. Cl. 200—148 R **5 Claims**



1. A gas-blast type circuit interrupter, comprising:

an arc extinguishing chamber containing in use an arc extinguishing fluid and having disposed therein a pair of separable contacts at least one of which is movable;

a pressure chamber in fluid communication with said arc extinguishing chamber for temporarily storing the arc extinguishing fluid at a raised pressure raised by an elec-

tric arc established in use between said contacts when the same are separated;

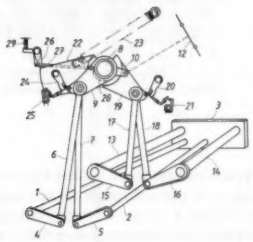
and electric field relaxation means for relaxing an electric field in the vicinity of said contacts, thereby improving the voltage withstanding characteristics across the separated contacts; said electric field relaxation means consisting essentially of an electrically conductive annular member electrically connected to one of said pair of contacts and extending toward the other of said pair of contacts and circumscribing the electric arc which is established in use between said pair of contacts, and an electrically insulative heat resistant arc resistant material covering surface portions of said annular member facing the electric arc which is established in use, and said annular member having dimensions effective to relax an electric field in the region of arcing between said pair of contacts after arc extinction is completed.

4,256,941

SPRING OPERATING DEVICES FOR HIGH-VOLTAGE CIRCUIT-BREAKERS

Sven Bachler, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Mar. 5, 1979, Ser. No. 17,120
Claims priority, application Sweden, Mar. 9, 1978, 7802673
Int. Cl.³ H01H *5/10*
U.S. Cl. 200—153 SC **3 Claims**



1. Spring operating device for high-voltage circuit-breakers, comprising:

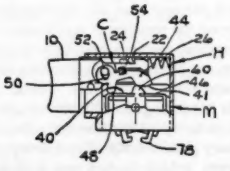
a support; an opening spring including at least two cooperating torsion bars arranged substantially parallel to each other with one end of each of said bars being permanently clamped to said support; a radially directed operating arm provided at the other end of said bars; and a rod system connected to said operating arms to transmit the spring force to the movable contact of a circuit-breaker, said operating arms and rod system being so arranged that said torsion bars have opposite directions of rotation.

4,256,942

TRIGGER OPERATED TOOL HANDLE SWITCH

Julius P. Wied, Hudson, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

Filed Nov. 27, 1978, Ser. No. 963,778
Int. Cl.² H01H *1/44, 13/52*
U.S. Cl. 200—157 **4 Claims**



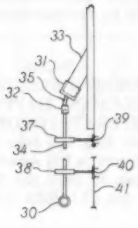
1. An electric switch mechanism for portable electric motor-drive type tools comprising, an insulator switch housing, at least a pair of stationary electrical contacts disposed in said switch housing in spaced relation to each other and with their contact making faces substantially coplanar, a reciprocable contact carrier disposed in the housing for linear reciprocation therein relative to said stationary contacts, a movable electrically conductive bridging contact carried by said contact carrier and having opposite contacting ends forming respectively a leading contact end and a trailing contact end spaced at approximately the same spacing as said stationary contacts for sliding movement between a non-bridging position where said bridging contact is out of engagement with at least one of said stationary contacts and a bridging position where the bridging contact is in engagement with at least two of said stationary contacts in electrically conducting relation therewith, hinge means rotatably securing said bridging contact at a point adjacent its trailing contact end to said contact carrier, bias means in the contact carrier urging the movable bridging contact towards the stationary contacts, and a projection disposed between said stationary contacts for engagement with said leading contact end and configured for pivoting and lifting the leading contact end off of the adjacent respective stationary contact with a quick break action during movement of the bridging contact leading contact end to a level substantially above the contact making face of the adjacent respective stationary contact.

4,256,943

TOGGLE SWITCH ACTUATING APPARATUS

Richard D. Whitlock, 306 Bicentennial Ct., Powell, Wyo. 82435

Filed Feb. 23, 1979, Ser. No. 14,372
Int. Cl.³ H01H *3/04*
U.S. Cl. 200—331 **6 Claims**



1. Apparatus for actuating an electrical toggle switch including a rigid rod member, carriage means disposed along the length of said rod member supporting said rod member for movement with respect thereto, fastening means associated with said carriage means for securing said carriage means to a fixed surface adjacent to an electrical toggle switch, connecting means on the end of said rod member adjacent to said switch, said connecting means including a cap-like rod-engaging portion and a cap-like toggle-engaging portion extending in different directions, a pivotable section connecting said rod-engaging portion with said toggle-engaging portion, and an enlarged portion on the free end of said rod member remote from said toggle switch.

4,256,944

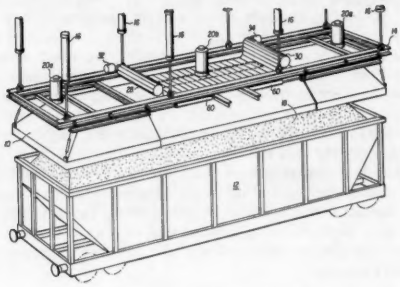
APPARATUS AND METHOD FOR THAWING MATERIALS STORED IN GONDOLA-TYPE CONTAINERS

Deryck Brandon, P.O. Box 176, Charlottesville, Va. 22902

Filed Apr. 9, 1979, Ser. No. 28,601
Int. Cl.³ H05B *6/80*
U.S. Cl. 219—10.55 F **19 Claims**

1. An apparatus for thawing materials stored in a gondola-type container having an open top face, comprising:

shielding hood means having an open face dimensioned to match the top open face of said gondola container for forming a shielded microwave heating cavity in combustion with said container, said hood means comprising shielding means adjacent the complete periphery of said hood means open face, said shielding hood means adapted to be arranged with said shielding means disposed in contacting engagement with the open face of said gondola container to form a microwave cavity in the space enclosed between said shielding hood means and said container, and,



microwave radiation means mounted in said shielding hood means for radiating the materials within the container with microwave energy upon contacting engagement of the respective open faces of the shielding hood means and the container;

whereby the material stored in the container within the microwave cavity formed by the container and the shielding hood means are heated and thawed by the microwave energy produced by the microwave radiation means.

4,256,945

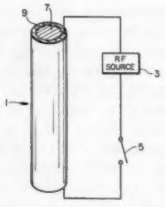
ALTERNATING CURRENT ELECTRICALLY RESISTIVE HEATING ELEMENT HAVING INTRINSIC TEMPERATURE CONTROL

Philip S. Carter, Palo Alto, and John F. Krumme, Woodside, both of Calif., assignors to Iris Associates, Palo Alto, Calif.

Filed Aug. 31, 1979, Ser. No. 71,682

Int. Cl.³ H05B *5/00*

U.S. Cl. 219—10.75 **11 Claims**



1. An alternating-current electrically resistive heating element electrically coupled to a source of high frequency electric power, said heating element having an electrical resistance which, at least over a certain range of temperatures, declines with increasing temperature, and comprises:

an electrically conductive non-magnetic substrate member of high thermal and high electrically conductive material and having over at least a portion of the surface thereof, a generally thin layer of a magnetic material having, below its Curie temperature, a maximum relative permeability greater than 1 and above its Curie temperature a minimum relative permeability of substantially 1, whereby when said heating element is electrically coupled to said source of high frequency electric power, an alternating current flows at said high frequency, causing Joule heating of said element, said current being principally confined by said maximum permeability to said generally thin magnetic layer in accordance with the effect at temperatures below the Curie temperature of said magnetic layer, said current spreading into said non-magnetic member as temperature rises to approach said Curie temperature and said relative permeability declines.

4,256,946

ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE

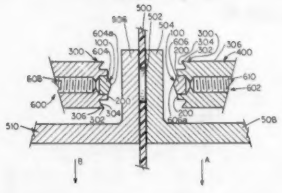
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210. This application Jan. 22, 1979, Ser. No. 5,669

The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.

Int. Cl.³ B23K *11/30*

U.S. Cl. 219—78.15 **5 Claims**



1. In an apparatus having electrodes for extruding and electrically fusing lead parts through an aperture in a lead-acid battery case to form a connection therethrough, the improvement wherein said electrode comprises distinct upsetting, compression, and forging portions, said forging portions being disposed generally away from said aperture relative to said upsetting and compression portions by a distance of less than one-half of the thickness of the portion of the battery case through which said aperture is formed, whereby the degree of contact between the lead parts within the aperture is limited by contact between said forging portion and said lead parts prior to the softening of said lead parts during said fusing.

4,256,947

CAR BODY WELDING ASSEMBLY SYSTEM

Ettore De Candia, 78240 Chambourcy, Montaigu, France

Continuation-in-part of Ser. No. 803,960, Jun. 6, 1977, Pat. No. 4,162,367. This application Jul. 20, 1979, Ser. No. 59,453

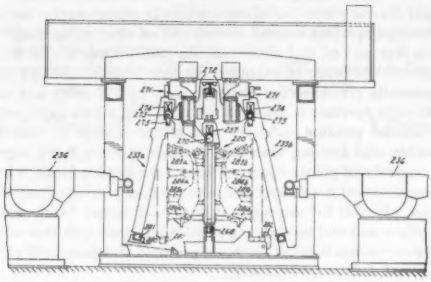
The portion of the term of this patent subsequent to Jul. 24, 1996, has been disclaimed.

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—79 **25 Claims**

1. A vehicle body welding system comprising, fixture means for accurately positioning multiple component parts of a vehicle body in relative juxtaposition at a framing welding station, programmable means for welding of said component parts into an inter-fixed assembled relation, said fixture means including interchangeable means for accurately locating different of said multiple component parts of different vehicle bodies at said station, means for mounting said fixture means for selective movement between an open position for admitting introduction of a preliminary preassembly of said component parts for any of said different vehicle bodies and a closed position in which said fixture means clamps said component parts for the

immediate vehicle body in properly oriented configuration for welding, said programmable means including differently pro-



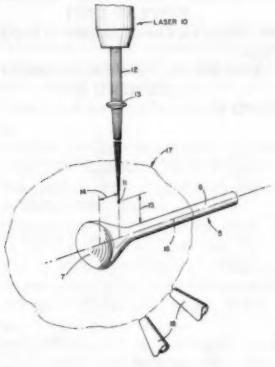
grammable means for welding said multiple component parts to match each different body at said station.

4,256,948

INTEGRAL BEADED STYLUS WIRE AND METHOD OF MAKING SAME

Peter H. Wolf, Campbell, and Boyd E. Slade, Sunnyvale, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Dec. 15, 1978, Ser. No. 970,003
Int. Cl.³ B23K *27/00*; B41J *3/00*
U.S. Cl. 219—121 LE **16 Claims**



1. A stylus wire for use in a matrix printhead, comprising:
a thin, elongated metal stem, having first and second axial ends, with a continuous and integral solid sphere-like head at said first axial end, and
an impacting means, affixed to and partially surrounding said head, for transmission to a printing medium of a compressive force exerted substantially axially against said second axial end during a printhead operation.

4,256,949

METHOD AND WIRE FOR SUBMERGED ARC WELDING OF PIPE

Stephen F. Baumann, Ashtabula; Masahiro Nakabayashi, Jefferson; Gerald D. Uttrachi, Ashtabula, all of Ohio; Thomas L. Coless, Lewiston, and Ernest N. Levine, Englewood, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 778,620, Mar. 17, 1977, abandoned. This application Mar. 27, 1979, Ser. No. 24,322
Int. Cl.³ B23K *35/362*
U.S. Cl. 219—146.24 **7 Claims**

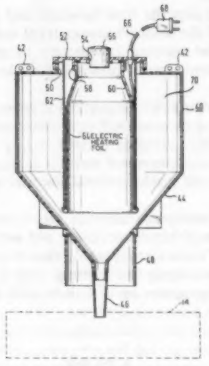
1. A wire for submerged arc welding of high strength low alloy pipeline steels used with a flux consisting essentially of 39.9 wt.% SiO_2; 2.5 wt.% Al_2O_3; 33.8 wt.% CaO; 11.3 wt.% CaF_2; 11.9 wt.% TiO_2 and 0.3 wt.% FeO; such wire consisting essentially of 0.10 wt.% C; 2.48 wt.% Mn; 0.61 wt.% Si; balance iron with the proviso that when manganese is greater than 2.5 up to 3.5 wt.% the silicon content is between 0.1 wt.% to 1.5 wt.% and when the manganese content is between 2.0 to 2.5 wt.% the silicon content is greater than 0.3 wt.% up to 1.5 wt.%.

4,256,950

ELECTRICALLY HEATED ANIMAL WATERER

Georg Wildgruber, Münchnerstr. 44/Postf. 34, 8068 Pfaffenhofen, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 900,002
Int. Cl.³ A01K *7/00*; F24H *1/20*; H05B *3/82*; B67D *5/62*
U.S. Cl. 219—306 **6 Claims**

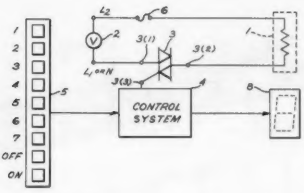


1. A livestock watering device comprising: a liquid supply tank having an access opening provided at its top and an outlet opening at its lower end; a collecting vessel arranged underneath said supply tank; holding means for said supply tank; a lid removably mounted over said access opening of said supply tank, said lid forming a pressure-tight seal with said tank to close said access opening; an automatic feed means for transferring liquid from said tank to said vessel through said outlet opening, said feed means being operable in response to liquid removal from said vessel; and a heating means in said tank for heating the liquid contained in said tank, said heating means being attached to said lid in a manner extending into said tank so as to be immersible in liquids contained in said tank, wherein said heating means is formed as an electric resistance heating foil inserted between first and second concentrically aligned tubes, said tubes being sealably connected together in a manner electrically isolating said foil from the liquid in the tank, said tubes defining a tubular structure having first and second open ends, means securing the first open end of the tubular structure to the inner surface of said lid, the second open end of said tubular structure being spaced above the bottom of said tank whereby the liquid in the tank is in direct contact with the inner and outer surfaces of said tubular structure.

4,256,951
REPETITION RATE POWER CONTROL FOR APPLIANCE USING HIGH CURRENT INRUSH ELEMENTS

Thomas R. Payne, Louisville, Ky., and Alfred L. Baker, Longmount, Colo., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1979, Ser. No. 8,360
Int. Cl.³ H05B 1/02
U.S. Cl. 219—492 **16 Claims**

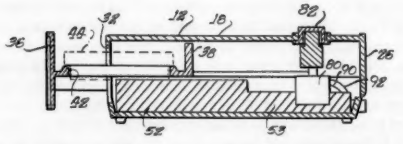


1. A power control arrangement for controlling the power output of a heater element adapted for connection to a household AC power supply comprising:
- an operator control including a plurality of manually selectable power level settings,
- means for repetitively applying power pulses of fixed duration to said element in response to operator selection of said settings,
- means for varying the time between said power pulses as a function of the selected power level settings,
- said means for varying comprising means for generating digital control signals corresponding to said power level settings,
- a zero cross over pulse generator for generating a zero cross over pulse at or near each zero cross over of said supply,
- a binary counter coupled to said supply and operative to count to a predetermined number in step with said supply and reset, said predetermined number comprising a period,
- means for identifying different repetitive patterns in the counts of said binary counter, said patterns repeating a plurality of times during said period at different rates, and
- means for associating each setting with a different pattern and applying power to said element at a rate determined thereby.

4,256,952
DRAWER TYPE STERILIZER UNIT

Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Apr. 9, 1979, Ser. No. 28,170
Int. Cl.³ A61L 2/04
U.S. Cl. 219—521 **3 Claims**

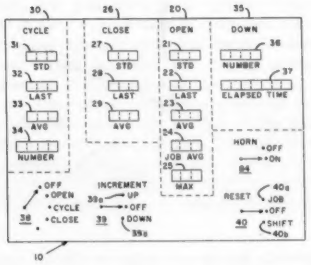


1. A contact lens disinfector unit of the type designated to receive a lens case having a pair of contact lenses immersed within a disinfecting solution disposed within said case, wherein said disinfector unit is adapted to heat said disinfecting solution to an elevated temperature thereby to asepticize said lenses, said disinfector unit comprising: a housing having an open end wall and track means disposed internally of said housing; electrical resistent heating means carried within said housing and including an electrically heated heating block having a generally planar upper surface; and drawer means slidably mounted with respect to the track means on the interior of said housing and received within said open end wall, said drawer means including a generally planar section having through aperture formed therein and an upstanding panel on the free end of said drawer means said drawer means being movable between an extended position wherein said aperture generally planar section projects from said housing and said through aperture is disposed for receiving a lens case, and a retracted position, wherein said planar section is received within said housing with said through aperture being superposed of said planar upper surface of the heating block, a lens case disposed in said aperture with the base portion of said lens case exposed for engagement with said heater block upper surface, and said up-standing panel being sized such that when drawer means is in the retracted position, said panel will close the end wall of said housing.

4,256,953
CYCLE INCREMENT DURATION MEASURING AND DISPLAY UNIT

Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Bethel, Conn.

Filed Oct. 31, 1978, Ser. No. 956,511
Int. Cl.³ G06G 7/00
U.S. Cl. 235—92 T **17 Claims**

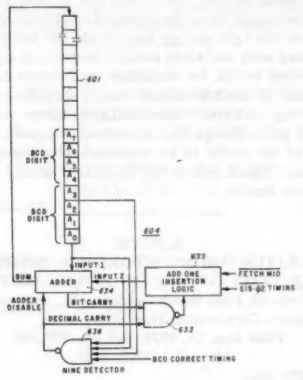


1. A measuring and display unit for use with a machine performing a repeating work cycle having a plurality of steps with the one of the steps being an operator step including an operator act and with the duration of the operator step being varied by the operator's performance, comprising means for providing a signal at the initiation of the operator step means for providing a signal at the end of the operator step, means for measuring and displaying the numerical value of the last duration between the two signals for each cycle, and means for displaying the numerical value of at least one previous duration between the two signals for each cycle representative of the duration of an identical previous operator step or average of identical previous operator steps, said last and previous display means being located near the area occupied by the operator to facilitate observation of the displayed durations by the operator and comparision of the duration of the just completed operator step with the duration of an identical previously completed operator step or with the average duration of identical previously completed work steps.

4,256,954
FAST BINARY CODED DECIMAL INCREMENTING CIRCUIT

Ashok H. Someshwar, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 783,517, Apr. 1, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 16,778
Int. Cl.³ H03K *27/00*
U.S. Cl. 235—92 SH **8 Claims**



1. An incrementing and binary coded decimal corrector circuit for incrementing and for automatically binary coded decimal correcting in response to a control signal a number stored as a series of bits representing a plurality of binary coded decimal digits in a memory having an output, said circuit comprising:

(a) first adder means having sum and carry outputs for adding one to the least significant bit of the least significant binary coded decimal digit output from said memory in response to said control signal,

(b) second adder means having sum and carry outputs for adding one to bits outputted from said memory in response to a carry being outputted from either of said adder means during a preceding bit of the binary coded decimal digit being outputted from said membory and in response to a decimal carry signal,

(c) sampling means for sampling both the most and the least significant bits of the least significant binary coded decimal digit outputted from said memory,

(d) detection means, responsive to said sampling means, and said control signal, for temporarily disabling the sum outputs of both said adder means and momentarily generating said decimal carry signal during the outputting of the least significant bit of the next binary coded decimal digit from said memory whenever:

(i) the binary coded decimal digit being outputted from said memory is equivalent to a decimal nine, and

(ii) said control signal is present.

4,256,955
SYSTEM FOR KEEPING ACCOUNT OF PREDETERMINED HOMOGENEOUS UNITS

Georges Giraud, Le Vesinet, and Jean Mollier, Bougival, both of France, assignors to Compagnie Internationale pour l'Informatique, Paris, France

Filed Mar. 23, 1978, Ser. No. 889,517
Claims priority, application France, Mar. 31, 1977, 77 09822
Int. Cl.³ G06K *5/00*; G07F *7/08*; G06K *7/06, 19/06*
U.S. Cl. 235—380 **27 Claims**

1. A system for keeping a record of predetermined homogeneous units comprising: an article bearing information, external means for imprinting and/or operating on the information on the article,

said article comprising:

a memory for storing coded bits in first, second and third fields, said first field having an unalterable multibit field indicative of

an identification of the use for which the article is intended,

said second field being an unalterable multibit field having an identification of the units used to keep account of operations which can be performed with the article and

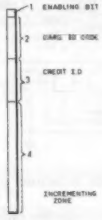
the third field being an alterable multibit field indicative of the number of credit units available to the holder of the article; circuits for controlling the memory; and

means for temporarily coupling the article to said imprinting and/or operating means;

said external imprinting and/or operating means including means for reading data from and writing data into the memory of the article;

said external means including: means for writing into the memory of the article indications of at least one of the following parameters:

(a) the number of units required or received by the holder



of the said article within the limits of the capacity of the memory, and

(b) the number of units received or required by the holder of the article to be subtracted from the number of units available in the memory of the article.

27. In combination, a credit card having a first binary memory field having N_1 bits, a second binary memory field having N_2 bits, where N_1 and N_2 are predetermined integers greater than one, bits of said first field being subject to change in response to signals from an external device, bits of said second field not being subject to change in response to signals from an external device after having been stored in the second field, a pre-selected number of bits stored in the second field having a first binary value, the bits of the first value in the second field, once stored, being irreversible, an external device including first and second means, said first means reading bit values from and supplying bit values to the first field so that bits stored in the first field are altered in response to signals from the first means, said second means including means for reading bit values from the second field, and means for deriving an alarm signal in response to the bit values read from the second field by the second means indicating that the number of bits in the second field differs from the pre-selected number for the first value.

4,256,956
CODE IDENTIFICATION APPARATUS

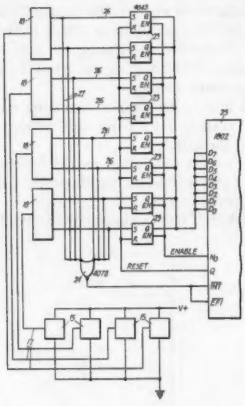
Dennis Hopkinson, Newport, Australia, assignor to Access Control Systems Pty. Ltd., Australia

Filed Feb. 7, 1980, Ser. No. 119,333
Claims priority, application Australia, Mar. 2, 1979, PD7882
Int. Cl.³ G06K *7/08, 7/016*
U.S. Cl. 235—449 **9 Claims**

1. Code identification apparatus comprising a coded instrument having successive rows of code locations and a reader to which to apply the instrument, said reader comprising:

a body defining an instrument guideway along which to move the instrument with said rows of code locations transverse to the direction of movement of the instrument;

a row of code sensors spaced transversely across the guideway such that on movement of the instrument along the guideway the rows of code locations on the instrument will successively pass the row of code sensors with one code location of each row registering with one of the code sensors, the code sensors being effective to produce output signals indicative of code information at the code



locations as those code locations pass the code sensors; and

signal processing means to receive output signals from all of said code sensors, to determine when there is an output signal from any one or more of said code sensors as a measure of time intervals during which successive rows of code locations are passing the code sensors, to accumulate code sensor output signals received during said time intervals, and to register the accumulated signals on the conclusion of each of said time intervals.

4,256,957

BOTTLE INSPECTION APPARATUS

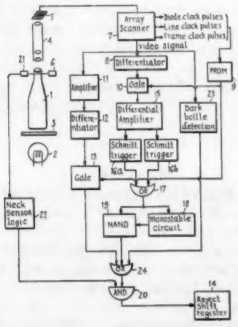
Geoffrey E. Ford, and Antis N. Pantelides, both of Bedford, England, assignors to T I Fords Limited, Kempston, England

Filed Aug. 2, 1978, Ser. No. 930,167

Claims priority, application United Kingdom, Aug. 11, 1977, 33820/77

Int. Cl.³ H01J *39/12*

U.S. Cl. 250—223 B **8 Claims**



1. A bottle inspection apparatus for detecting dirt or foreign bodies in transparent bottles while being conveyed to bottle filling apparatus, comprising means for moving bottles to be inspected past inspection means, said inspection means comprising a source of illumination, diffuser means between said source and a bottle being inspected whereby diffusely to illuminate an area of the bottle to be inspected, means for projecting an image of said area on to an integrated circuit device comprising an array of photodiodes arranged in a plurality of rows with a plurality of diodes in each row in combination with array scanner means cyclically to scan the array and interrogate each diode in turn, along each row in turn, to provide a video signal comprising a sequence of electrical signals corresponding to the light energy each diode has received, means synchronised with said array scanner to generate gating pulses of the desired length for each row, and means feeding said video signal to electric circuit means including means for differentiating said video signal and gate means controlled by said gating pulses for gating-out unwanted signals outside the said area of the bottle to be inspected whereby to generate differentiated signal pulses representative of dirt or foreign bodies in the bottles.

4,256,958

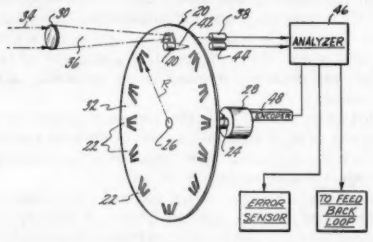
APPARATUS FOR MONITORING THE OPTICAL QUALITY OF A BEAM OF RADIATION

Dean F. Cornwell, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 26, 1978, Ser. No. 973,338

Int. Cl.³ G01D *5/36*

U.S. Cl. 250—233 **9 Claims**



1. An apparatus for monitoring the defocus and astigmatic errors and jitter of a beam of radiation comprising:

a disk adapted for rotation about a central axis;

means for rotating the disk about the central axis;

a plurality of slit sets symmetrically disposed circumferentially within the disk at a radial position, wherein each slit set is adapted for passing focused radiation therethrough and each slit set comprises a first slit and a second slit angularly disposed to the first slit wherein both slits are symmetrically disposed about a radius line passing from the radial position of the plurality of slit sets through the central axis, wherein the first and second slits are adapted for providing a first scan and a second scan, angularly disposed to the first scan to the focused radiation to obtain data signals proportional to the radial and azimuthal position of the focused radiation as a function of time and the plurality of slit sets comprises a repetitive group of slits, wherein each group of slits includes a first slit set disposed proximate a front surface of the disk and a second slit set disposed proximate a back surface of the disk, wherein each slit of the first slit set has an exit passage extending from the slit to the back surface with the width of the exit passage being much greater than the width of the slit and each slit of the second slit set has an entrance passage extending from the front surface to the slit with the width of the slit being much less than the width of the entrance passage wherein variation in data signals resulting from the difference in location of the first and second slit sets

within the disk are proportional to the amount and direction of defocus and astigmatism of the focused radiation;

means for focusing radiation through a slit in the slit set;

a first detector adapted for sensing focused radiation passing through each slit of a slit set to provide a data signal;

means for providing synchronization radiation through a slit in the slit set;

a second detector adapted for sensing the synchronization radiation passing through the slit to provide a synchronization signal; and

means for monitoring the synchronization signal and the data signal to provide output signals proportional to defocus and astigmatic errors and jitter of a beam of radiation.

4,256,959

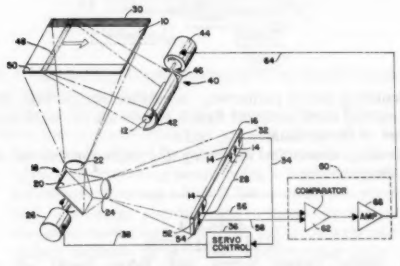
OPTICAL SCANNER INCLUDING FEEDBACK FOR REFLECTOR CONTROL

William A. Monette, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 12, 1979, Ser. No. 75,298

Int. Cl.³ H04N *1/10*

U.S. Cl. 250—235 **10 Claims**



6. An optical scanning device for scanning a document and directing light reflected from successively scanned areas on the document to an image processor, comprising:

platen means for supporting a document to be scanned,

reflective reference means, adjacent said platen means, for providing a surface of substantially uniform reflectivity,

a source of light,

adjustable means for directing light from said source of light to produce a bar of light extending across a portion of said document and said surface,

reference means for providing electrical reference signals in response to variations in light incident thereon,

optical scanning means for directing light reflected from successively scanned areas of said document to said image processor and for directing light reflected from successively scanned areas of surface to said reference means, and

illumination control means, responsive to said electrical reference signals, for adjusting said adjustable means such that said bar of light illuminates said successively scanned areas of said document as said areas are scanned.

4,256,960

INSTRUMENT AND METHOD FOR CALIBRATING NUCLEAR CAMERAS

David M. Snider, New Berlin, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1979, Ser. No. 60,442

Int. Cl.³ G12B *13/00*; H03K *5/153*; G01T *1/20*

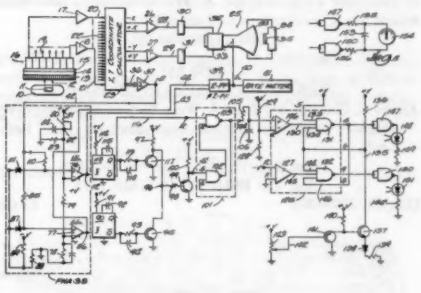
U.S. Cl. 250—252 **11 Claims**

11. A method of testing and calibrating the gain of each photomultiplier tube in a scintillation camera comprising the steps of:

directing a beam of photons from a radioisotope source into the scintillator to which the photomultiplier tubes are optically coupled and in alignment with a tube that is to be tested, said radioisotope producing photons having a broad spectrum of energies including a preferred spectral band or window defined by lower and upper energy limits,

summing the analog output signals from each tube resulting from photon absorption events in the scintillator to obtain total energy analog signals whose amplitudes are proportional to the total energies of successive events,

producing a first series of pulses of predetermined amplitude and duration in correspondence with each total energy signal amplitude peak that is above said lower energy limit and within said window and concurrently producing a second series of pulses of predetermined amplitude and duration in correspondence with each total energy signal



amplitude peak which is above said upper energy limit and above said window,

adding an increment of charge to an integrating capacitor to thereby raise its voltage in correspondence with occurrence of each pulse in one series and subtracting an increment of charge from said capacitor to thereby lower its voltage in response to occurrence of each pulse in the other series,

continuously sensing the voltage on said integrating capacitor and providing indicating means to indicate, respectively, if the sensed voltage is above or below a predetermined value to thereby enable a determination as to whether total energy signals within said window or above said window predominates so that the gain of the photomultiplier tube under test may be adjusted to make total energy signals falling within said window predominate.

4,256,961

X-RAY SPECTROSCOPE

Takashi Shoji, Settsu, and Tadashi Utaka, Takatsuki, both of Japan, assignors to Rigaku Industrial Corporation, Takatsuki, Japan

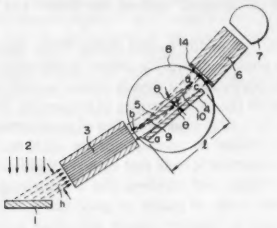
Filed Jun. 27, 1979, Ser. No. 52,942

Int. Cl.³ G01N *23/20*

U.S. Cl. 250—272 **10 Claims**

1. An X-ray spectroscope comprising a means for causing emission of characteristic X-rays of a sample to be analyzed, a soller slit disposed such that one end thereof faces said sample, a plurality of reflecting means disposed parallel to one another and with one end thereof facing the other end of said soller slit

such that X-rays having passed through said soller slit are incident on said reflecting means with a predetermined angle



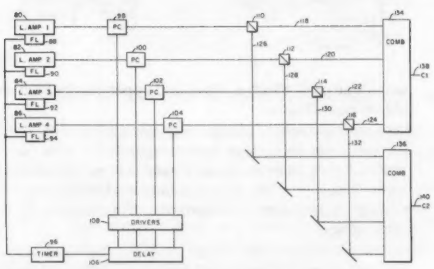
of incidence and a detector, X-rays diffracted by said reflecting means being incident on said detector.

4,256,962

LASER PULSE SUPERIMPOSING

James A. Horton, and John A. Weis, both of Kennewick, Wash., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Dec. 19, 1977, Ser. No. 861,848
Int. Cl.[2] B01D *59/44*; G02F *1/16*
U.S. Cl. 250—281 **13 Claims**



1. A system for pulse shaping pulsed laser radiation employed in photoexcitation comprising:
a source of pulsed radiation;
means responsive to the pulsed laser radiation from said source for temporally segmenting each pulse of laser radiation into temporally distinct segments;
means for separating the segments onto discrete, physically separate paths;
means for temporally adjusting the segments to be substantially coincident; and
means responsive to the adjusted pulse segments on the different paths for superimposing the segments onto a unitary path to produce a composite pulse along said unitary path of duration shorter and amplitude greater than the original pulse from said source.

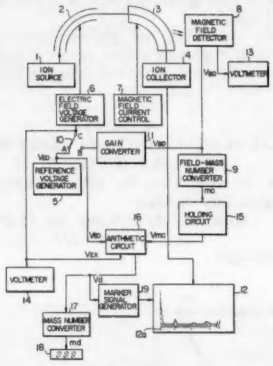
4,256,963

MASS SPECTROMETER

Sadao Takahashi, and Yoshiaki Katoh, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 28, 1979, Ser. No. 80,025
Claims priority, application Japan, Sep. 29, 1978, 53-119348; Fed. Rep. of Germany, Jun. 13, 1979, 2831936
Int. Cl.[3] B01D *59/44*
U.S. Cl. 250—296 **17 Claims**

1. A mass spectrometer of the type wherein a metashtable ion originating from a precursor ion is measured by scanning the magnetic and electric field at a constant ratio between the two fields, comprising:
means for generating a first electrical signal representative of the mass number of the precursor ion;
means for generating a second electrical signal corresponding to a value of the electric field at which the mass number of the precursor ion is detected;
means for generating a third electrical signal corresponding to a value of the electric field which is being scanned;



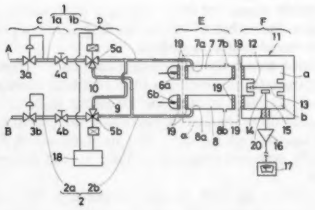
calculating means performing calculation on the first, second and third electrical signals to provide the mass number of the metastable ion; and
indicating means for indicating the mass number of the metastable ion.

4,256,964

GAS ANALYZER

Kozo Ishida; Osamu Saitoh, and Takao Imaki, all of Miyanohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 22, 1978, Ser. No. 972,485
Claims priority, application Japan, Jan. 10, 1978, 53-1726
Int. Cl.[3] G01J *1/00, 1/42*
U.S. Cl. 250—345 **4 Claims**



1. A gas analyzer comprising:
a first conduit for the supply of a gas to be tested;
a second conduit for the supply of a standard gas;
a first cell;
a second cell;
gas flow path change-over means, connected to said first and second conduits, for alternating at fixed intervals between a first gas supply arrangement wherein fixed amounts of said gas to be tested and said standard gas are simultaneously supplied to said first and second cells, respectively, and a second gas supply arrangement wherein said fixed amounts of said gas to be tested and said standard gas are simultaneously supplied to said second and first cells, respectively;
light source means for directing light rays through said first and second cells; and

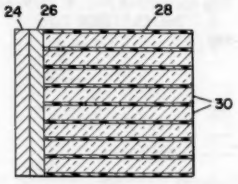
detector means for receiving said light rays after passing through said cells.

4,256,965

HIGH ENERGY FLUOROSCOPIC SCREEN

A. D. Lucian, deceased, late of Carmichael, Calif. (by Betty J. Lucian, Administrator), assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 15, 1979, Ser. No. 3,437
Int. Cl.³ G01T *1/20*; G01N *23/22*; G01T *1/00*
U.S. Cl. 250—367 **7 Claims**



1. A high energy, filmless radiographic system for inspecting large objects comprising:

(a) means for generating a high energy photon beam;

(b) means for converting the varying photon flux from a specimen irradiated by said high energy photon beam to light, said converting means being a high energy fluoroscopic screen having a high-Z foil to convert a portion of said high energy photon beam to secondary radiation, a phosphor coated on said high-Z foil to convert said secondary radiation to light, and a polycellular image converter (PIC) attached to said phosphor to gather said light and to convert an additional portion of said high energy photon beam to light; and

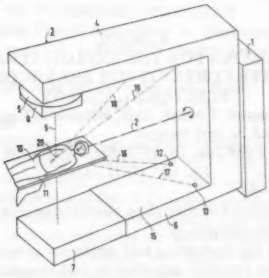
(c) means for sensing and displaying the light from said converting means.

4,256,966

RADIOTHERAPY APPARATUS WITH TWO LIGHT BEAM LOCALIZERS

Lothar R. Heinz, Lafayette, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Aug. 24, 1979, Ser. No. 69,294
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926873
Int. Cl.³ G01N *21/00, 23/00*
U.S. Cl. 250—491 **5 Claims**



1. A radiation emitting apparatus, comprising in combination:

(a) a radiation source comprising an electron accelerator being adapted to project a beam of radiation along a central axis onto a surface to be irradiated, said radiation being focused at a focal point;

(b) a first light-beam localizer for emitting a first plane light fan towards said surface;

(c) a second light-beam localizer for emitting a second plane light fan towards said surface, said second light fan intersecting the first light fan in an intersecting line which coincides with said central axis, whereby said first and second light fans form an intersection of two light lines on said surface; and

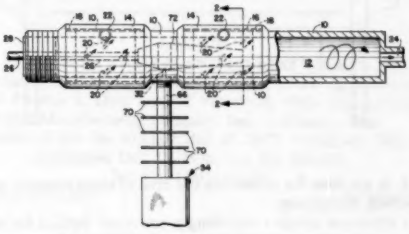
(d) means associated with said first light-beam localizer for projecting a scale towards said surface along with said first light fan, wherein said scale is provided with numerals which indicate in said intersection the distance between said focal point and said surface.

4,256,967

ARC REACTOR DEVICE

Richard W. Treharne, Xenia; Charlton K. McKibben, Dayton; Donald R. Moles, and Mitchell R. M. Bruce, both of Yellow Springs, all of Ohio, assignors to Charles F. Kettering Foundation, Dayton, Ohio

Filed Jul. 25, 1979, Ser. No. 60,537
Int. Cl.³ C01B *21/32*
U.S. Cl. 250—544 **9 Claims**



1. An arc reactor device for producing nitrogen oxides by an arc discharge process, comprising:

an electrically conductive casing, defining an arc discharge chamber therein, and having inlet opening means and outlet opening means communicating with said chamber,

an electrically conductive discharge electrode, electrically insulated from said casing and extending into said chamber,

power source means for applying an arc discharge potential between said discharge electrode and said casing, thereby producing electrical arcing between said discharge electrode and said casing to form nitrogen oxides from air supplied to said chamber through said inlet opening means, said nitrogen oxides being removed from said chamber through said outlet opening means, said power source means including a d.c. power source connected between said discharge electrode and said casing through a resistor,

a starter electrode extending into said chamber and being movable from an extended position, in which said starter electrode contacts said discharge electrode, to a retracted position, in which said starter electrode is out of contact with said discharge electrode, said starter electrode being electrically connected to said casing, and

means for moving said starter electrode from said extended position at initiation of operation of said arc reactor device to said retracted position and maintaining said starter electrode in said retracted position during operation of said arc reactor device, said means for moving said starter electrode including

a solenoid actuator, coupled to said starter electrode and including a solenoid coil connected electrically in parallel with said resistor, for withdrawing said starter electrode

from said extended position to said retracted position as said arc discharge potential is applied between said discharge electrode and said casing and said coil is energized, and

spring means for applying a spring force to said starter electrode, urging said starter electrode toward its extended position, whereby said starter electrode is returned to said extended position at termination of operation of said arc reactor device.

4,256,968

AREA MEASURING MACHINE

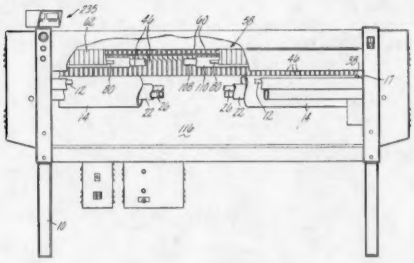
Roy Morris, and Terence J. Pickering, both of Scarborough, England, assignors to USM Corporation, Farmington, Conn.

Filed Feb. 7, 1979, Ser. No. 10,135

Claims priority, application United Kingdom, Feb. 9, 1978, 5181/78

Int. Cl.[3] **G01N** *21/86*

U.S. Cl. 250—560 **9 Claims**



1. A machine for measuring the area of sheet material, said machine comprising:

a conveyor means comprising a conveyor surface for supporting sheet material the area of which is to be measured and for conveying the sheet material through said machine in the operation thereof;

a plurality of wheels disposed side by side across said machine and arranged to run on sheet material conveyed by said conveyor means or, in the absence of sheet material, on said conveyor surface;

detecting means, one associated with each wheel for detecting the presence of a piece of sheet material between each wheel and said conveyor surface;

signalling means for signalling each time the periphery of a wheel has been rotated through a unit distance and for emitting a signal to be summed should the output from said detecting means associated with that wheel indicate that a piece of sheet material is present between the wheel and the conveyor surface;

computing means for summing the signals from each wheel to indicate the area of a piece of sheet material;

means arranged to emit a test start signal; and

test means actuated by the test start signal, to cause, in the absence of sheet material, all of said detecting means to emit a signal which would normally indicate the presence of sheet material for a predetermined length of travel of the conveyor surface such that each of the signalling means associated with the wheels of a group of wheels should said machine be functioning correctly, emits a number of test signals, said test means comprises a test circuit including a comparator by which the total number of test signals emitted by the signalling means of said group of wheels is compared with an acceptable range of numbers of test signals which would be emitted in respect of said group of wheels when said machine is functioning within predetermined tolerances, said test means being so constructed and arranged as to indicate the event that the comparator signals that the total number of test signals emitted by the signalling means of said group of wheels is not within the acceptable range of numbers of test signals.

4,256,969

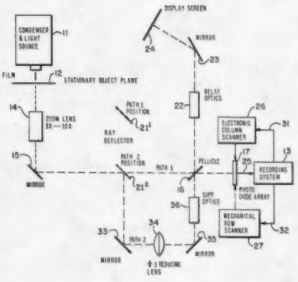
GRAPHICAL REPRESENTATION TRANSDUCING

Thomas A. Lianza, Beverly, Mass., assignor to Eikonix Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 960,051, Nov. 13, 1978, abandoned. This application Nov. 8, 1979, Ser. No. 92,493

Int. Cl.[3] **G06K** *7/10*

U.S. Cl. 250—566 **7 Claims**



1. Graphical representation transducing apparatus comprising,

means defining an object plane for supporting a fixed object to be imaged in a photoelectric transducing means image plane,

lens means comprising means for focussing the image of said object upon said photoelectric transducing means image plane,

photoelectric array transducing means in said photoelectric transducing means image plane for providing an electrical signal representative of the light intensity thereon,

and means for mechanically displacing in said image plane said photoelectric transducing means to scan the image of said object.

4,256,970

APPARATUS FOR THE EXPLOITATION OF UNDERWATER CURRENTS FOR THE PRODUCTION OF ELECTRICAL ENERGY

Osvaldo Tomassini, Taranto, Italy, assignor to Eugene Pascucci, Trenton, N.J., a part interest

Filed Jun. 25, 1979, Ser. No. 51,708

Int. Cl.[3] **F03B** *13/10*

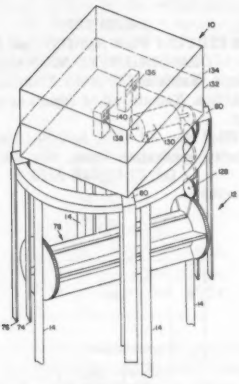
U.S. Cl. 290—53 **13 Claims**

1. An apparatus for generating electrical energy from underwater currents comprising:

a structure for supporting said apparatus in water;

rotor means rotatably attached to said structure and locatable in said underwater currents, said rotor means comprising a housing and a plurality of movable blades, said housing including a plurality of interior slots which pass through the center of said housing and which respectively slidably receive said movable blades;

generating means connected to said rotor means for generating electrical energy; and,



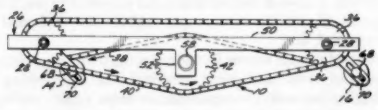
drive means for positioning said rotor means relative to said structure.

4,256,971

WAVE AND WIND MOTION ENERGY TRANSDUCER

Rodney Griffith, 6905 E. Ocean Blvd., Long Beach, Calif. 90803

Filed Nov. 16, 1979, Ser. No. 95,509
Int. Cl.[3] F03B *13/12*
U.S. Cl. 290—53 **7 Claims**



1. An energy transducer comprising a plurality of laterally spaced apart eccentric weights mounted for rotation upon vertical drive axles, a flywheel coupled for rotation with a vertical flywheel shaft, interconnecting drive linkage means, for driving said flywheel in response to movement of said eccentric weights, and clutch means engageable by said eccentric weights as said weights rotate in either direction to advance said drive linkage means to rotate said flywheel and said flywheel shaft in a single direction of rotation.

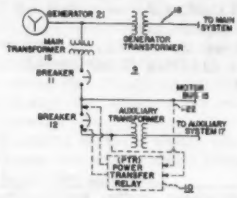
4,256,972

POWER TRANSFER RELAY CIRCUITRY AND METHOD OF PHASE MEASUREMENT

Michael A. Wyatt, Tampa, and Robert W. Beckwith, Seminole, both of Fla., assignors to Beckwith Electric Co., Inc., Largo, Fla.

Filed May 10, 1979, Ser. No. 37,680
Int. Cl.[3] H02J *9/06, 3/08*
U.S. Cl. 307—68 **5 Claims**

1. A power transfer relay circuit for providing synchronous transfer of power from a secondary A.C. source to a bus to which power from a first A.C. source has been interrupted such as due to a fault in said first A.C. source system which bus has an induced residual A.C. voltage which may be of a varying frequency, said transfer relay circuit controlling a circuit breaker having a defined closing time period for selectively connecting the secondary source to said bus; said power transfer relay circuit comprising, in combination, respective means for sensing the A.C. voltage frequency of the secondary source and the residual A.C. voltage frequency on the bus, means for measuring the phase difference between secondary voltage and bus voltage, means for measuring the rate of change of said phase difference, means for measuring said phase difference acceleration, and means for comparing said phase difference



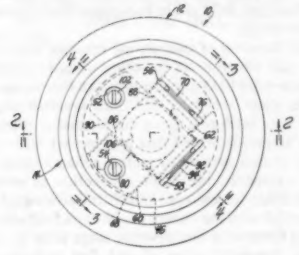
with the rate of change of said phase difference plus the phase difference acceleration and the circuit breaker timing period to provide a circuit breaker closing signal.

4,256,973

PRESSURE SWITCH AND CIRCUIT MEANS

Aloysius J. Kochanski, Southfield, Mich.; Frank D. Mowery, and Charles J. Hire, both of Mansfield, Ohio, assignors to Hi-Stat Manufacturing Company, Inc., Lexington, Ohio

Division of Ser. No. 818,607, Jul. 25, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,200
Int. Cl.[3] H01H *35/24*
U.S. Cl. 307—118 **26 Claims**

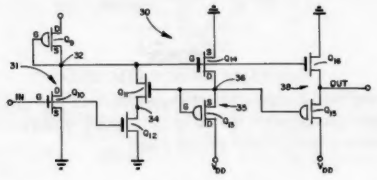


1. A pressure responsive electrical switch assembly, comprising housing means, pressure responsive movable wall means carried by said housing means, said movable wall means effectively defining first and second chamber means within said housing means, at least first and second stationary contact means operatively carried by said housing means, at least first and second movable contact means operatively carried by said movable wall means, solid state electrical circuit means operatively carried by said movable wall means and electrically connected to said first and second movable contact means, resilient means normally operatively biasing said movable wall means in a direction toward said first chamber means and operatively biasing said first and second movable contact means in a direction away from said first and second stationary contact means, first electrical terminal means forming an electrical extension of said first stationary contact means, and second electrical terminal means forming an electrical extension of said second stationary contact means.

4,256,974
METAL OXIDE SEMICONDUCTOR (MOS) INPUT CIRCUIT WITH HYSTERESIS

Clarence W. Padgett, Westminster, and Melvin L. Marmet, Corona, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1978, Ser. No. 946,940
Int. Cl.³ H03K *19/092, 19/094*
U.S. Cl. 307—475 **4 Claims**



1. A metal oxide semiconductor input circuit suitable for receiving relatively low voltage TTL input signals having a narrow voltage swing and for providing MOS level output signals that are clearly distinguishable from one another, said input circuit including:

a first inverter stage having respective input and output terminals, the input terminal of said first inverter stage connected to an input terminal of said input circuit,

a second inverter stage having respective input and output terminals,

a third inverter stage having respective input and output terminals, the output terminal of said third inverter stage comprising the output terminal of said input circuit,

each of said first, second and third inverter stages comprising the series connection of an enhancement and a depletion-type field effect transistor,

the output terminal of said first inverter stage connected to each of the input terminal of said second inverter stage and to the gate electrode of one of the enhancement or depletion-type field effect transistors that forms said third inverter stage;

the output terminal of said second inverter stage connected to the gate electrode of the other of said enhancement or depletion-type field effect transistors that forms said third inverter stage, whereby said third inverter stage transistors have a push-pull drive configuration relative to the output terminals of said first and second inverter stages;

first and second series connected enhancement-type field effect transistors, the series connection of said first and second enhancement-type transistors connected in electrical parallel with the enhancement-type field effect transistor that forms said first inverter stage so as to control the turn-on threshold point of said first inverter stage enhancement-type transistor;

said gate electrode of a first of said first and second series connected enhancement-type field effect transistors is connected to the output terminal of said second inverter stage, and the gate electrode of the second of said first and second series connected enhancement-type field effect transistors is connected to the input terminal of said input circuit;

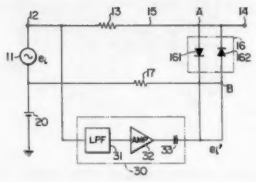
said series connection of said first and second enhancement-type field effect transistors is connected between the output terminal of said first inverter stage and a supply of reference potential; and

said input circuit providing a feedback path from the output terminal of said second inverter stage to the gate electrode of one of said series connected first and second enhancement-type field effect transistors via said second inverter stage, said feedback path controlling the conductivity of the series connection of said first and second enhancement-type field effect transistors so as to selectively clamp the output terminal of said first inverter stage to said supply of reference potential when said feedback path is activated.

4,256,975
LIMITER CIRCUIT FOR REMOVING NOSE FROM DEMODULATED SIGNALS

Isao Fukushima, Katsuta; Hiroyuki Kimura, Yokohama, and Hideo Nishijima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 30, 1978, Ser. No. 964,796
Claims priority, application Japan, Nov. 30, 1977, 52/142613
Int. Cl.³ H04B *1/10*
U.S. Cl. 307—543 **9 Claims**



5. A limiter circuit comprising:

a first circuit means connected between a transmission line for transmitting a demodulated signal received at a demodulated signal input terminal to a demodulated signal output terminal and the ground, said first circuit means including a series circuit of a limiter and a bias source, said limiter having reference limiting levels defined by said bias source and suppressing the transmission of that part of said demodulated signal which exceeds said reference levels; a second circuit means for connecting the junction point of said bias source and said limiter with said input terminal; and

a control circuit means including a third circuit means connected with said input terminal, for eliminating such higher harmonic components as noise pulses superposed on said demodulated signal received at said input terminal and for passing only the demodulated signal free from said noise pulses, and a fourth circuit means for connecting said third circuit means with said limiter so as to supply the output of said third circuit means to said limiter and for attenuating the signal exceeding in amplitude said reference limiting levels of said limiter by shunting said signal to the ground, said control circuit means causing said reference limiting levels of said limiter to vary following the waveform of the signal having passed through said third circuit means.

4,256,976
FOUR CLOCK PHASE N-CHANNEL MOS GATE

Sergio Maggi, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 7, 1978, Ser. No. 967,334
Int. Cl.³ H03K *17/687, 17/26, 17/28*
U.S. Cl. 307—583 **1 Claim**

1. In an N-channel MOS integrated circuit operating in response to a clock having four phases, $\phi 1$, $\phi 2$, $\phi 3$ and $\phi 4$, each of which has one, but only one, other phase which does not overlap therewith, an improved gate comprising:

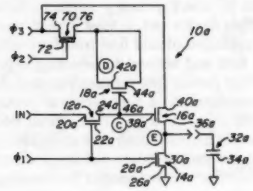
an input device of the enhancement type, the input device having a source portion connected to an input signal, a gate portion connected to the $\phi 1$ clock, and a drain portion;

a discharge device of the enhancement type, the discharge device having a source portion connected to a circuit ground, a gate portion connected to the $\phi 1$ clock, and a drain portion providing an output signal;

a resistive device of the depletion type, the resistive device

having a gate portion connected to the $\phi 2$ clock, a source portion connected to the $\phi 3$ clock, and a drain portion;

a charge-discharge device of the enhancement type, the charge-discharge device having a source portion connected to the drain portion of the discharge device, a gate portion connected to the drain portion of the input device, and a drain portion connected to the $\phi 3$ clock; and,



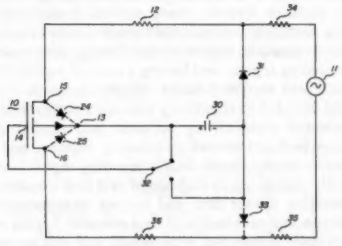
a capacitive device of the enhancement type, the capacitive device having source and drain portions connected to the drain portion of the resistive device, and a gate portion connected to the gate portion of the charge-discharge device.

4,256,977

ALTERNATING POLARITY POWER SUPPLY CONTROL APPARATUS

Thomas E. Hendrickson, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 26, 1978, Ser. No. 973,215
Int. Cl.[3] H03K *17/60;* **H01L** *29/72*
U.S. Cl. 307—571 **58 Claims**



1. An electronic switching circuit for controlling transfer of electrical power from an alternating polarity electrical power supply means to a load means, said switching circuit comprising:

a first transfer control field-effect device provided in and on a first substrate, said first transfer control field-effect device comprising:

a first transfer control field-effect device channel region located at least in part in a first selected region of said first substrate;

first transfer control field-effect device first and second terminating regions, separated by said first transfer control field-effect device channel region, into which and out of which primary currents through said first field-effect device can, at least in part, pass upon electrical energization of said first transfer control field-effect device first and second terminating regions, said first field-effect device first terminating region being electrically connected to a first terminal means adapted for electrical connection to a first circuit portion arrangement which includes both said alternating polarity electrical power supply means and said load means, and said first field-effect device second terminating region being electrically connected to a second terminal means adapted for electrical connection to said first circuit portion arrangement; and

a first transfer control field-effect device gate region capable of affecting, upon electrical energization thereof, any current flow occurring through said first transfer control field-effect device channel region as a result of electrical energization of said first transfer control field-effect device first and second terminating regions;

an energy storage means having first and second polarity regions between which said energy storage means is capable of providing electrical energy storage, said energy storage means first polarity region being electrically connected to said first substrate;

a first unidirectional current conducting means having therein first and second terminating regions between which an asymmetrical current conducting capability is exhibited, said first unidirectional current conducting means first terminating region being electrically connected to said energy storage means second polarity region, and said first unidirectional current conducting means second terminating region being electrically connected to one of said first and second terminal means; and

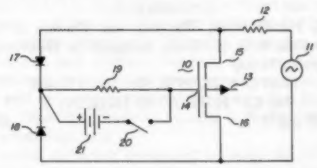
a control switch means capable, upon activation, of effectively electrically connecting said first transfer control field-effect device gate region to a selected one of (i) said first substrate, and (ii) said first unidirectional current conducting means first terminating region, whereby electrical power can be selectively transferred from said alternating polarity electrical power supply means to said load means in correspondence with said selection of electrical connection for said first transfer control field-effect device gate region.

4,256,978

ALTERNATING POLARITY POWER SUPPLY CONTROL APPARATUS

B. Hubert Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 26, 1978, Ser. No. 973,216
Int. Cl.[3] H03K *17/60;* **H01L** *29/72*
U.S. Cl. 307—584 **19 Claims**



1. An electronic switching circuit for controlling transfer of electrical power from an alternating polarity electrical power supply means to a load means, said switching circuit comprising:

a first transfer control field-effect device provided in and on a substrate, said first transfer control field-effect device comprising:

a first channel region located at least in part in a first selected region of said substrate;

first and second terminating regions, separated by said first channel region, into which and out of which primary currents through said first field-effect device can, at least in part, pass upon electrical energization of said first and second terminating regions, said first terminating region being electrically connected to a first terminal means adapted for electrical connection to a first circuit portion arrangement which includes both said alternating polarity electrical power supply means and said load means, and said second terminating region being electrically connected to a second terminal means

adapted for electrical connection to said first circuit portion arrangement; and

a gate region capable of affecting, upon electrical energization thereof, any current flow occurring through said first channel region as a result of electrical energization of said first and second terminating regions;

a bias control means having an electrical connection between a first location therein and a second location therein, and further, said bias control means being capable of selectively providing a bias voltage between said first and second locations therein upon electrical energization of said bias control means, said bias control means first location being electrically connected to said gate region;

a first unidirectional current conducting means having first and second terminating regions between which an asymmetrical current conducting capability is exhibited, said first unidirectional current conducting means first terminating region being electrically connected to one of said first and second terminal means, and said first unidirectional current conducting means second terminating region being electrically connected to said bias control means second location; and

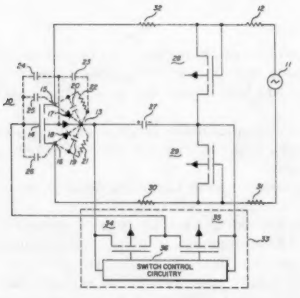
a second unidirectional current conducting means having first and second terminating regions between which an asymmetrical current conducting capability is exhibited, said second unidirectional current conducting means first terminating region being electrically connected to that one of said first and second terminal means opposite that to which said first unidirectional current conducting means first terminating region is connected as aforesaid, and said second unidirectional current conducting means second terminating region being electrically connected to said bias control means second location, whereby electrical power can be selectively transferred from said alternating polarity electrical power supply means to said load means in correspondence with said selective providing of said bias voltage between said bias control means first and second locations.

4,256,979

ALTERNATING POLARITY POWER SUPPLY CONTROL APPARATUS

Thomas E. Hendrickson, Wayzata, and Thomas C. Spindler, Coon Rapids, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 26, 1978, Ser. No. 973,463
Int. Cl.[3] H03K *17/60*; H01L *29/72*
U.S. Cl. 307—571 **60 Claims**



1. An electronic switching circuit for controlling transfer of electrical power from an alternating polarity electrical power supply means to a load means, said switching circuit comprising:

a first transfer control field-effect device provided in and on a first substrate, said first transfer control field-effect device comprising:

a first transfer control field-effect device channel region located at least in part in a first selected region of said first substrate;

first transfer control field-effect device first and second terminating regions, separated by said first transfer control field-effect device channel region, into which and out of which primary currents through said first field-effect device can, at least in part, pass upon electrical energization of said first transfer control field-effect device first and second terminating regions, said first field-effect device first terminating region being electrically connected to a first terminal means adapted for electrical connection to a first circuit portion arrangement which includes both said alternating polarity electrical power supply means and said load means, and said first field-effect device second terminating region being electrically connected to a second terminal means adapted for electrical connection to said first circuit portion arrangement; and

a first transfer control field-effect device gate region capable of affecting upon electrical energization thereof, any current flow occurring through said first transfer control field-effect device channel region as a result of electrical energization of said first transfer control field-effect device first and second terminating regions;

a first parasitic bypass means having first and second terminating regions and having a control region therein by which said first parasitic bypass means is capable of being directed to effectively provide a conductive path of a selected conductivity between said first parasitic bypass means first and second terminating regions, said first parasitic bypass means first terminating region being electrically connected to one of said first transfer control field-effect device first and second terminating regions, and said first parasitic bypass means second terminating region being electrically connected to said first substrate; and

a second parasitic bypass means having first and second terminating regions and having a control region therein by which said second parasitic bypass means is capable of being directed to effectively provide a conductive path of a selected conductivity between said second parasitic bypass first and second terminating regions, said second parasitic bypass means first terminating region being electrically connected to that one of said first transfer control field-effect device first and second terminating regions opposite that to which said first parasitic bypass means is electrically connected, as aforesaid, and said second parasitic bypass means second terminating region being electrically connected to said first substrate, whereby shunting can be provided between said first substrate and said first transfer control field-effect device first and second terminating regions.

4,256,980

ELECTRONIC SWITCHOVER CIRCUIT

Akihiro Asada; Hiromichi Tanaka, both of Yokohama, and Kaname Ohta, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

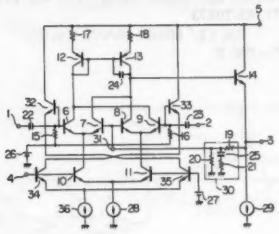
Filed Nov. 28, 1978, Ser. No. 964,117
Claims priority, application Japan, Nov. 30, 1977, 52-142727
Int. Cl.[3] H03K *17/16, 17/62*
U.S. Cl. 307—254 **3 Claims**

1. In an electronic switchover circuit comprising,

at least two differential amplifier sets each having an independent input signal terminal and first and second transistors connected differentially; and

control means for selectively operating one of the differential amplifier sets, said control means including a controlling differential amplifier having third and fourth transistors in differential connection respectively connected in series with each differential amplifier set and a constant

current source, wherein the differential amplifier sets are selectively on-off controlled by selectively on-off controlling the third and fourth transistors of the controlling differential amplifier to thereby deliver out the input signal applied to the selected differential amplifier set;



the improvement which comprises a pair of fifth transistors connected respectively to the bases of the first transistors on the input signal side of the two differential amplifier sets, said fifth transistors being connected so as to be non-conductive when the associated first transistor is conductive but being conductive when the associated first transistor is not conductive.

4,256,981

CIRCUIT ARRANGEMENT FOR GENERATING A PULSE WITH A DELAYED EDGE

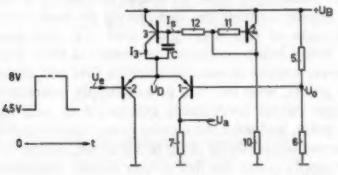
Klaus Juhnke, Rellingen, and Hartmut Harlos, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1979, Ser. No. 14,386

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813127

Int. Cl.³ H03K *5/04*

U.S. Cl. 307—266 **5 Claims**



1. A circuit arrangement for generating an output pulse having one edge delayed relative to the corresponding edge of an input pulse comprising, first and second transistors connected together to form a differential amplifier with interconnected emitters coupled to a supply voltage source via a third transistor, means for applying said input pulse to the base of the first transistor, means for applying a drive current to the base of the third transistor in such a way that in the static condition the third transistor supplies a substantially constant current, means connecting the collector of the third transistor to the interconnected emitters of the first and second transistors, and means connecting a capacitor between the base and the collector of the third transistor which is proportioned so that a delay occurs as a result of a variation in charge of the capacitor which delay is determined by the drive current for the third transistor thereby to delay the current supplied by the third transistor to the interconnected emitters for one edge of an input pulse.

4,256,982

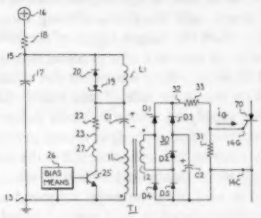
ELECTRIC PULSE SHAPING CIRCUIT

Ronald B. Bailey, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed May 2, 1979, Ser. No. 35,351

Int. Cl.³ H03K *5/07, 5/01, 3/01*

U.S. Cl. 307—268 **4 Claims**



1. In combination:

(a) a pair of input terminals adapted to be connected to a source of d-c power;

(b) a transformer having a primary winding and at least one secondary winding;

(c) a first capacitor connected in series with said primary winding;

(d) means including an inductor for connecting the series combination of said primary winding and said first capacitor to said input terminals, whereby said first capacitor accumulates a charge from said source of d-c power;

(e) normally open switching means connected in parallel with said primary winding and said first capacitor, said switching means being periodically switched to a closed state in which it conducts discharge current from the first capacitor through said primary winding and also conducts current from said source of d-c power through said inductor;

(f) a pair of d-c output terminals adapted to be connected to a load circuit;

(g) full wave rectifier means for connecting said secondary winding to said output terminals, said rectifier means including a first diode connected between said secondary winding and one of said output terminals for conducting load current when said capacitor discharge current is flowing in said primary winding, and second and third diodes serially connected between said secondary winding and said one output terminal for conducting load current when capacitor charging current is flowing in said primary winding; and

(h) a second capacitor connected between the other output terminal and the junction of said second and third diodes.

4,256,983

VOLTAGE-TO-FREQUENCY CONVERTER HAVING A CONSTANT FREQUENCY MODE OF OPERATION

Robert J. Griffith, and Thomas D. Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed May 2, 1979, Ser. No. 35,358

Int. Cl.³ H03L *7/00*

U.S. Cl. 307—271 **6 Claims**

1. In an electrical circuit for periodically generating discrete output signals, the combination comprising:

a. means for supplying a variable control signal having a value that can vary between predetermined low and high extremes;

b. integrating means having input and output terminals;

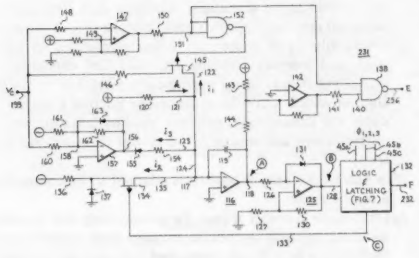
c. signal applying means connected to the input terminal of said integrating means and responsive to said control signal for applying to said input terminal a first signal having a value that varies as an inverse linear function of the control signal value during variations of the latter

within a predetermined range defined by said predetermined high extreme and a predetermined intermediate value which is inbetween said low and high extremes, the value of said first signal being essentially zero whenever the value of said control signal is at said predetermined high extreme;

d. bistable threshold detecting means connected to the output terminal of said integrating means and having first and second states, said bistable detecting means being in its first state when the output signal of the integrating means has a value on one side of a predetermined threshold and being in its second state whenever the value of said output signal is on the other side of said threshold;

e. means for supplying a train of clock pulses having a constant frequency and a predetermined period;

f. normally inactive means connected to the input terminal of said integrating means and effective when activated for applying to said input terminal a second signal having a predetermined duration, said second signal being applied subtractively with respect to said first signal and having an average value, during said predetermined period of said clock pulses, substantially equal to the value that said first signal will have whenever said control signal has said predetermined intermediate value;



g. said integrating means being operative to produce at its output terminal a variable output signal having a value that depends on the time integral of the net value of signals applied to said input terminal and that tends to change from said one side of said predetermined threshold to said other side when the value of said first signal exceeds that of said second signal; and

h. logic means connected to said bistable detecting means, to said clock pulse train supplying means, and to said normally inactive means and responsive to said bistable detecting means changing from said first to said second states for activating said normally inactive means and for producing a discrete output signal in synchronism with one of said clock pulses, said logic means also being operative periodically to produce additional discrete output signals synchronized with successive clock pulses supplied to the logic means so long as said bistable detecting means remains in its second state, whereby the average frequency of said discrete output signals corresponds to the frequency of said clock pulses when the value of said control signal is lower than said intermediate value but decreases toward zero as the control signal value increases within said predetermined range and approaches said high extreme.

4,256,984

INTERLEVEL INTERFACE FOR SERIES POWERED IIL OR SITL

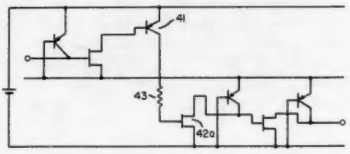
Masayuki Kojima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,670

Claims priority, application Japan, Jun. 15, 1977, 52-70872; Jun. 15, 1977, 52-70873

Int. Cl.[3] **H03K** *19/091, 19/092*

U.S. Cl. 307—296 R **2 Claims**



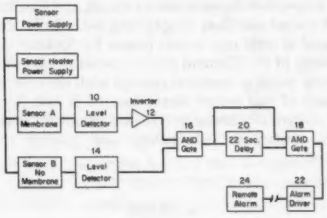
2. In a series powered logic circuit including a first plurality of bipolar transistors and second plurality of junction field effect transistors, each junction field effect transistors of said second plurality of junction field effect transistors having source and drain regions of a first conductivity type joined by a channel region of the first conductivity type, a gate region of opposite conductivity type forming a PN junction with said channel region, said channel region being non-conductive between said source and drain in the absence of a voltage applied between said source and gate of a polarity effective to forward bias the junction between said gate and said channel, said logic circuit including at least first and second logic circuit levels, each level comprising first and second power supply connections, at least one logic gate including one transistor of said first plurality of transistors and one transistor of said second plurality of transistors, said one transistor of said first plurality of transistors having its emitter connected to said first power supply connection, having its base connected to said second power supply connection, and having its collector connected to an input node of said logic gate, said one transistor of said second plurality of transistors having its gate connected to said input node, its source connected to said second power supply connection, and having its drain serving as an output node of said logic gate, said first and second logic circuit levels being connected in series via their first and second power supply connections across first and second power supply points, with the first power supply connection of said first logic circuit level being connected to said first power supply point, and with the second power supply connection of said second logic circuit level being connected to said second power supply point, the first power supply connection of said second logic level being coupled to the second power supply connection of said first logic level, a second transistor of said first plurality of bipolar transistors having its emitter connected to the first power supply connection of said first logic level, its base connected to the output node of said logic gate of said first level, the collector of said second transistor of said first plurality of bipolar transistors being coupled to the gate of a second transistor of said second plurality of transistors, the source of said second transistor of said second plurality of transistors being connected to the second power supply connection of said second logic level, the drain of said second transistor of said second plurality of transistors connected to the input node of said logic gate of said second logic circuit level, the improvement comprising: a current limiting element, wherein the collector of said second transistor of said first plurality of bipolar transistors is coupled to the gate of said second transistor of said second plurality of transistors via said current limiting element for limiting the current supplied to said second transistor of said second plurality of transistors from said second transistor of said first plurality of bipolar transistors.

4,256,985

SPECIFICITY OF SEMICONDUCTOR GAS SENSOR

Louis H. Goodson, Kansas City, Mo., and William B. Jacobs, Overland Park, Kans., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Jun. 7, 1978, Ser. No. 913,280
Int. Cl.[3] G01N 27/12
U.S. Cl. 307—308 7 Claims



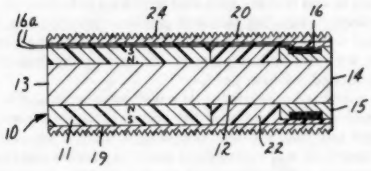
1. An oil spill detector comprising: a pair of electronic sensors responsive to both hydrocarbon vapors and other airborne contaminants the detection of which is not desired; a semipermeable membrane covering only one of said sensors, said membrane being impermeable to said hydrocarbon vapors; and electronic circuitry means connected to said sensors for discriminating between the presence of said hydrocarbon vapors and the presence of said other airborne contaminants.

4,256,986

MAGNETIC PICKUP SUBASSEMBLY

Glenn R. Anderson, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 16, 1979, Ser. No. 30,464
Int. Cl.[3] H02K 21/38
U.S. Cl. 310—155 11 Claims



1. Subassembly of a magnetic pickup, said subassembly comprising

an elongated ferromagnetic pole piece which is substantially symmetrical about an axis,

a matrix-bonded permanent magnet sleeve which fits closely around the pole piece and is substantially coterminous with one end of the pole piece while not substantially extending beyond the other end of the pole piece, the magnet sleeve having preferred directions of magnetization radial to said axis and there being no ferromagnetic path directly between the inner and outer surfaces of the sleeve,

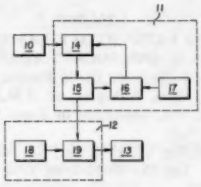
said subassembly being formed to receive an electrical coil around said other end of the pole piece.

4,256,987

CONSTANT CURRENT ELECTRICAL CIRCUIT FOR DRIVING PIEZOELECTRIC TRANSDUCER

Akihiro Takeuchi, and Kiyokazu Asai, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Apr. 24, 1979, Ser. No. 32,875
Claims priority, application Japan, Apr. 24, 1978, 53-48548
Int. Cl.[3] H01L 41/08
U.S. Cl. 310—316 15 Claims



1. An electrical circuit for driving a piezoelectric transducer comprising:

a DC electric source,

a constant current circuit connected to said DC electric source for processing a DC signal from said DC electric source and supplying a constant output current having a predetermined constant value, said constant current circuit being comprised of a current detecting circuit for detecting current flowing from said DC electric source to said piezoelectric transducer, a reference voltage generating circuit for generating a reference voltage, a voltage comparison circuit for comparing an output voltage of said current detection circuit with said reference voltage and a DC constant current control circuit for controlling the output current to a predetermined constant value by supplying an output voltage having a voltage value in response to an output signal of said voltage comparison circuit and supplying a constant output current, and

an oscillation circuit connected to said constant current circuit for driving said piezoelectric transducer with a resonance frequency and a constant current,

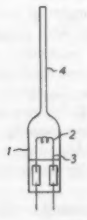
thereby approximately driving said piezoelectric transducer with a constant current by supplying said constant current to said oscillation circuit.

4,256,988

INCANDESCENT HALOGEN LAMP WITH PROTECTIVE ENVELOPE COATING

James R. Coaton; John M. Rees, both of London, and Roger N. Rothon, Runcorn, all of England, assignors to Thorn Lighting Limited and Imperial Chemical Industries Limited, both of London, England

Continuation of Ser. No. 758,872, Jan. 17, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 973,441
Int. Cl.[3] H01K 1/32, 1/50
U.S. Cl. 313—221 3 Claims



1. In a electrical incandescent lamp comprising an envelope

of vitreous material having a gas fill containing fluorine and a tungsten filament mounted therein, the improvement comprising:

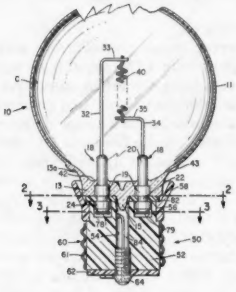
a continuous imperforate transparent coating applied directly to the internal surface of said envelope, said coating consisting essentially of aluminum oxide resistant to fluorine attack and being derived from a compound of aluminum deposited on said surface from solution, said coating having a thickness in the range from 0.001 to 1 micron.

4,256,989

INCANDESCENT LAMP WITH FILAMENT MOUNTING MEANS AND SOCKET ADAPTOR

Donald G. Trutner, Chatham; David Kovacs, Lake Hopatcong; Raymond P. Fontana, Waldwick, all of N.J., and Luke Thorington, Easton, Pa., assignors to Duro Test Corporation, North Bergen, N.J.

Filed Sep. 22, 1978, Ser. No. 944,725
Int. Cl.[3] H01J *5/48, 5/50*
U.S. Cl. 313—318 **19 Claims**



1. A baseless incandescent electric lamp adapted for detachable mounting to an adaptor comprising:

an envelope of glass material,

a pair of rigid studs of electrically conductive material hermetically sealed directly to a portion of said envelope, each stud being integrally formed with a first portion extending into the envelope and a second portion extending exterior of the envelope to which electrical contact is to be made with means in the adaptor to supply current to the lamp, said second portion of at least one of said studs formed with a reduced width portion intermediate the end of said second portion and the envelope for positively locking the lamp to the adaptor in a detachable manner,

a wire electrically connected to the first portion of each of said studs, and

an incandescent filament electrically connected between said wires.

9. The combination of a baseless incandescent electric lamp and adaptor, said lamp including:

an envelope of a glass material having a bottom portion,

a pair of rigid filament wire mount means of electrically conductive material hermetically sealed to said bottom portion of said envelope, each mount means having a first portion extending into the envelope and a second portion extending exterior of the envelope to which electrical contact is to be made to supply current to the lamp, the second portion of at least one of said mount means also formed with a means for positively locking the lamp to the adaptor,

a wire electrically connected to the first portion of each of said mount means, and

an incandescent filament electrically connected between said wires,

said adaptor including a body of electrical insulating material,

means on said body for receiving the bottom portion of said envelope and mating means on said body for receiving the locking means of the second portion of said at least one filament mount means to positively lock the lamp to said adaptor, said mating means comprising a pair of slots formed in one end of the body, at least one of said slots being arcuate, each slot for receiving the second portion of a respective filament mount means, and first means at at least one of said slots cooperating with the locking means on said at least one mount means for locking the second portions of the filament mount means in said slots,

means for making electrical contact with the second portion of each of said mount means located in said slots, and

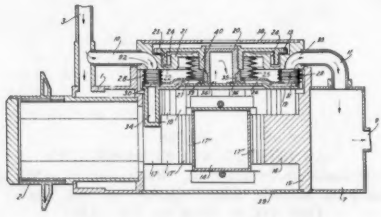
means electrically connected to said means for making electrical contact for connecting said adaptor to a lamp socket.

4,256,990

COOLING SYSTEM FOR TUNABLE MICROWAVE GENERATOR

Guido Busacca, Via Notarbartolo 35; Pietro Luparello, Via E. Leotta 15, and Vincenzo Meli, Via F. Cilea 97, all of Palermo, Italy

Continuation-in-part of Ser. No. 16,531, Mar. 1, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 31,582
Claims priority, application Italy, Mar. 6, 1978, 20903 A/78
Int. Cl.[3] H01J *25/50*
U.S. Cl. 315—39.61 **4 Claims**



1. In a microwave generator including a stationary electrode structure forming an array of evacuated resonant cavities centered on an axis inside a housing, a tuning disk transverse to said axis in said housing provided with a set of hollow plungers respectively extending into said cavities, and adjusting means coupled with said tuning disk for axially displacing same together with said hollow plungers for varying the frequency of the generated microwaves,

the combination therewith of a wall member in said housing spacedly overlying said disk and rigid therewith, said disk and said wall member bounding a shallow chamber isolated from said cavities and extending across and communicating with the interior of said hollow plungers, and conduit means forming a path for the circulation of a cooling fluid through said chamber and said hollow plungers between an inlet and an outlet at spaced-apart locations near the periphery of said disk.

4,256,991

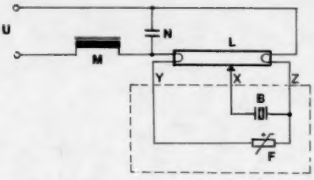
ELECTRONIC IGNITER FOR FLUORESCENT LAMPS

Matti N. T. Otala, Oulu, Finland, assignor to Otamation Oy, Oulu, Finland

Filed May 10, 1979, Ser. No. 37,490
Claims priority, application Finland, May 17, 1978, 781562
Int. Cl.[3] H05B *41/00, 41/14*
U.S. Cl. 315—104 **10 Claims**

1. Apparatus for igniting a gas discharge lamp from a source of voltage including in combination, a piezoelectric crystal

adapted to be activated to produce a high voltage pulse, striker means for actuating said crystal, said striker means including a bi-metallic member which rapidly changes physical shape in response to heating thereof, means including a positive temperature coefficient resistor for heating said bi-metallic member, means for connecting said source of potential to said resistor to heat said bi-metallic member to activate said crystal, and means for applying the resultant high voltage pulse to said lamp.



4,256,992

ELECTRIC DEVICE FOR STARTING AND FEEDING A METAL VAPOR DISCHARGE LAMP PROVIDED WITH A PREHEATABLE ELECTRODE

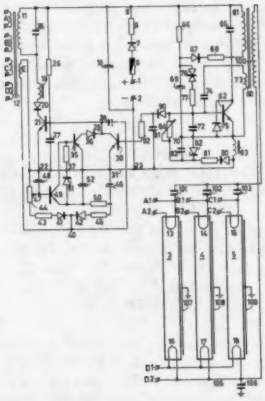
Meerten Luursema, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,120

Claims priority, application Netherlands, Mar. 2, 1978, 7801241

Int. Cl.³ H05B *41/29*

U.S. Cl. 315—106 **14 Claims**



1. In an electric light arrangement including a metal vapour discharge lamp provided with a preheatable electrode, the a device for starting and feeding said lamp comprising, two input terminals for connection to a d.c. voltage source, a first direct-to-alternating current converter coupled to the input terminals for supplying a preheating current to the preheatable electrode of the lamp, and a second direct-to-alternating current converter connected to the two input terminals for supplying a discharge current through the discharge lamp after the preheating current has been switched on.

4,256,993

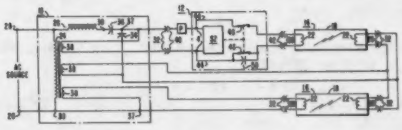
ENERGY SAVING DEVICE FOR RAPID-START FLUORESCENT LAMP SYSTEM

Edward W. Morton, Teaneck, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 4, 1979, Ser. No. 45,451

Int. Cl.³ H05B *41/16*

U.S. Cl. 315—106 **4 Claims**



1. An add-on device for connection in series with one lamp of a two-lamp rapid-start-type fluorescent light system to reduce by a predetermined amount the nominal electrical consumption and light output of the operating lamps, said lamps each comprising a tubular body terminating in double contacts at each end thereof with each of the double contacts electrically connecting to the ends of electrodes operatively disposed within said envelopes proximate the ends thereof, said rapid-start system comprising:

ballast transformer means having input terminals and output terminals, and said input terminals adapted to be connected to a source of electrical energy;

two pairs of socket means adapted to receive and retain the two rapid-start fluorescent lamps in series-circuit arrangement, and a starting capacitor means connecting in parallel with one of the lamps as connected in series circuit;

the output terminals of said ballast transformer means connecting through ballast capacitor means to those socket means which are adapted to receive the remote double contacts of said lamps as connected in series circuit in order to apply the secondary output voltage of said ballast transformer means and said ballast capacitor means across said series-connected lamps; and,

lamp electrode heater means comprising secondary transformer winding means associated with said ballast transformer means and connecting to said socket means to apply across each of the electrodes of said lamps as connected in said system a relatively small electrode heater voltage, said add-on device comprising:

(a) casing means having a pair of input contacts adapted to be connected with one of said socket means of said system, and a pair of output terminals for connection to the double contacts at one end of one of said lamps;

(b) said input contacts of said add-on device directly electrically connected to said output terminals of said add-on device through a pair of normally closed coil-operated relay contacts, and one of said relay contacts having connected in parallel therewith power-reducing capacitor means of predetermined value which, when in circuit with said lamps, will reduce by a predetermined amount the power consumed by said series-connected lamps as operated;

(c) a solid-state time-delay and relay-coil-energizing circuit connecting across said input contacts of said add-on device, the time-delay action of said circuit being initiated by the application of heater voltage across said input contacts of said add-on device when said system is initially energized to pass heater current through the lamp electrode connected thereto, and after said lamps in said system are operating with nominal wattage input and a short predetermined time has elapsed, said circuit operating to energize said relay coil and open said pair of normally closed relay contacts to place said power-reducing capacitor means in series circuit with said operating lamps, and said relay-coil-energizing circuit thereafter continuing to energize said relay coil to main-

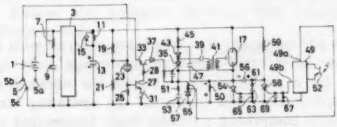
tain said relay contacts open until said system is deenergized.

4,256,994

ACTUATING CIRCUIT FOR LIGHT MEASURING CIRCUIT IN ELECTRONIC FLASH DEVICE

Kazuo Ikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1979, Ser. No. 77,722
Claims priority, application Japan, Oct. 7, 1978, 53-123892; Oct. 26, 1978, 53-131989
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—151 **8 Claims**



1. An electronic flash device having a flash tube, a main capacitor, an auxiliary capacitor, means for applying the sum of a voltage across said main capacitor and a voltage across said auxiliary capacitor to said flash tube, a light measuring circuit for producing a signal corresponding to a quantity of incident light from an object being photographed, and a control circuit responsive to the output signal from said light measuring circuit for controlling the duration of firing of said flash tube, the improvement comprising:

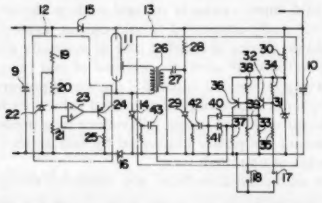
impedance means provided in the discharge path of said auxiliary capacitor which is rendered effective in response to an actuation of a trigger switch for said flash tube and having an output connected to a driving voltage input terminal of said light measuring circuit.

4,256,995

ELECTRONIC PRE-EMISSION FLASH DEVICE

Tokuji Ishida, Daito, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1979, Ser. No. 21,830
Claims priority, application Japan, Mar. 29, 1978, 53-36976
Int. Cl.³ H05B *41/34*
U.S. Cl. 315—241 P **8 Claims**



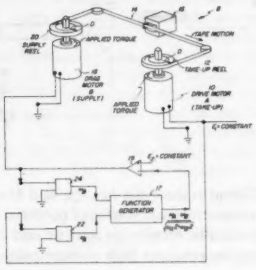
1. An electronic flash device comprising: an electronic flash tube; a first energizing means for energizing said flash tube with a regulated current; a second energizing means for energizing said flash tube with non-regulated electric current, a switch means for actuating said second energizing means, a first trigger circuit for triggering said flash tube with said switch means deactuated so that said flash tube may be energized by said first energizing means, and a second trigger circuit for triggering said flash tube and actuating said switch means subsequent to the triggering of said flash tube by said first trigger circuit.

4,256,996

WEB TRANSPORT SYSTEM

Steven W. Brooks, Pamona, and John M. Favrou, Del Mar, both of Calif., assignors to Spin Physics, Inc., San Diego, Calif.

Filed Jan. 29, 1979, Ser. No. 7,282
Int. Cl.³ B65H *59/38*; H02P *5/50*
U.S. Cl. 318—7 **6 Claims**



1. Web transport apparatus comprising:

(a) means for metering a web at a substantially constant rectilinear web speed,

(b) an electric take-up motor cooperative with said web for winding said web into a rolled pack thereof, said electric motor being a type motor having a torque-speed relationship substantially corresponding to a constant for the product of motor torque and rotary speed for constant web tension and rectilinear speed, and

(c) means for applying a constant voltage to said electric motor which is such as to put substantially constant tension in said web at any given motor speed

said means for metering said web at constant rectilinear speed comprising:

(a) an electric supply motor, adapted to cooperate with a rolled supply web pack, for metering said web from said pack, and

(b) means for applying a variable voltage to said motor which is such as to cause said supply motor to apply a drag force to said web, said variable voltage being proportional to the difference between a constant and the quotient of the product of the speeds of said take-up and supply motors divided by the square root of the sum of the squares of such motor speeds.

4,256,997

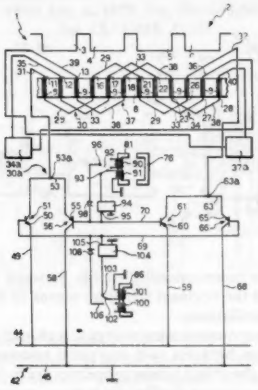
APPARATUS FOR THE SUPPLY, REGULATION AND CONTROL OF DIRECT CURRENT ELECTRICAL MACHINES

Giampiero Brusaglino, Turin, and Giorgio Peri, Gussola, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Jun. 22, 1978, Ser. No. 918,202
Claims priority, application Italy, Jul. 28, 1977, 68759 A/77
Int. Cl.³ H02P *1/23*
U.S. Cl. 318—254 **1 Claim**

1. Apparatus for the supply, regulation and control of a direct current electrical machine with electronic commutation and with an armature winding divided into individual winding sections, said apparatus comprising a plurality of distinct sections each for the supply and control of an associated said armature winding section, each said apparatus section including first and second control elements and first and second pairs of electronic switching means each comprising at least one transistor having a switching control element, means connecting said at least one transistor of said first pair of switching means and said at least one transistor of said second pair of switching means in parallel, and means connecting said switching control element of said at least one transistor of said first pair of switching means to said first control element to be controlled thereby, means connecting said switching control

element of said at least one transistor of said second of switching means to said second control element to be controlled thereby, a first disc fixed to a stator of said machine and a second disc fixed to a rotor of said machine and rotatable relative to said first disc, wherein said first and second control elements of each section of said apparatus comprise a plurality of photo-transistors arranged on said first disc and associated lamps cooperating with said plurality of phototransistors and



disposed on said second disc, wherein said phototransistors are arranged on two successive quadrants of the first disc, and said associated lamps comprise (i) two sets of stroboscopic lamps arranged in arcs and extending over two opposite quadrants of said second disc, and (ii) means for energizing said stroboscopic lamps with pulses staggered by T/n, where T is the period of said pulses and n is the number of sections of said winding.

4,256,998

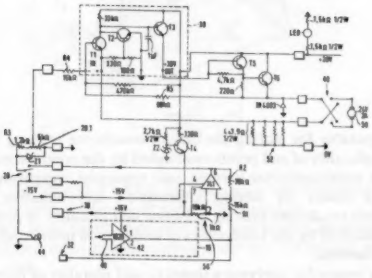
ELECTRICAL CONTROL ARRANGEMENT

Basil J. Samuels, Xanadu, Strawberry Hill, Constantia 7800, and Johann L. N. Besseling, Mayville, Nursery Rd., Rosebank 7700, both of South Africa

Continuation of Ser. No. 859,527, Dec. 12, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,468

Int. Cl.[3] H02P *5/16*

U.S. Cl. 318—335 **7 Claims**



1. An electrical control arrangement which includes
(a) a manually operable control device;
(b) a solid state module;
(c) an electronic transducer;
(d) an electronic torque control unit;
(e) a micro-motor;
(f) driving means for drivingly connecting the micro-motor to a hand piece;
(g) a first fluid supply conduit for supplying fluid from the control device to the solid state module;
(h) a second fluid supply conduit for supplying fluid from the solid state module to the electronic transducer;
(i) a first coolant supply conduit for supplying a coolant to the solid state module;
(j) a second coolant supply conduit for supplying the coolant from the solid state module to the micro-motor;
(k) connection means for electrically connecting respectively the electronic transducer to the electronic torque control unit, and the electronic torque control unit to the micro-motor, the electronic transducer being controllable by the manually operable control device which controls the fluid flow to the electronic transducer via the solid state module, the electronic torque control unit being controllable by the electronic transducer; and the speed of the micro-motor being variable in linear manner by the current supply from the electronic torque control unit.

4,256,999

CONTROL SYSTEM FOR THE STROKE LIMITATION OF A MACHINE TOOL ELEMENT

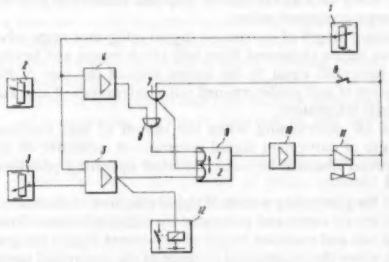
Günter Richter, Nabern, and Reinhard Fröschle, Ruit, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Gehring K.G., Nellingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 597,201, Jul. 18, 1975, abandoned. This application Oct. 27, 1977, Ser. No. 846,031

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1974, 2435498

Int. Cl.[3] G05B *1/06*

U.S. Cl. 318—560 **22 Claims**

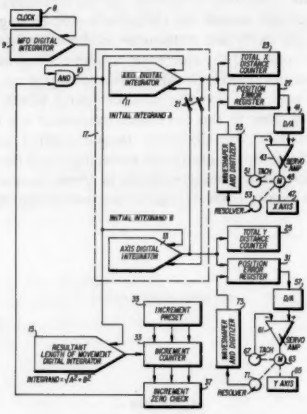


1. In combination with an analogous control system for very accurately controlling the stroke of an abutment-free machine element, especially the spindle of a honing machine having a rotary honing tool; at least one electric displacement pick-up for an abutment-free stroke limitation of the machine element and including first resistor means adjustable in conformity with the desired stroke end points, second resistor means variable in conformity with the machining movement of the machine element, and circuit means for comparing the voltages in said second resistor means due to preset value of current flow therein and operable for controlling the limiting of stroke movement of said element, said circuit means further including amplifier means, and signal means operable upon faulty operation of said second resistor means or of said amplifier means.

4,257,000
APPARATUS FOR CONTROLLING THE LENGTH OF MOVEMENT OF A CONTROLLED MEMBER ALONG A PATH OF REPEATED OPERATING POSITIONS

Richard L. Friberg, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed May 1, 1979, Ser. No. 35,134
Int. Cl.³ G05B *19/25*
U.S. Cl. 318—573 **10 Claims**



1. An apparatus for controlling the length of movement of a controlled member along a path of repeated operating positions which comprises:

clock means for providing iterate commands;

a function generator comprising an axis digital integrator with a predetermined initial integrand for each axis of movement of the controlled member, said digital integrator being responsive to an iterate command from said clock means and effective for generating axis position change command pulses;

means for controlling the movement of the controlled member along each axis thereof in response to said axis position change command pulses;

a resultant length of movement digital integrator responsive to an iterate command from said clock means and having an integrand equal to the square root of the sum of the squares of said predetermined initial integrands of said axis digital integrators;

means for determining when the output of said resultant length of movement digital integrator is indicative of the required distance between repeated operating positions; and

means for generating a control signal effective to disconnect said iterate command generated by said clock means from said axis and resultant length of movement digital integrators when the incremental distance of the controlled member between repeated operating positions has been reached.

4,257,001
RESONANT CIRCUIT SENSOR OF MULTIPLE PROPERTIES OF OBJECTS

Larry D. Partain, Pleasanton, and Mysore R. Lakshminarayana, Mission Viejo, both of Calif., assignors to John G. Abramo and Samuel V. Abramo, both of Wilmington, Del.

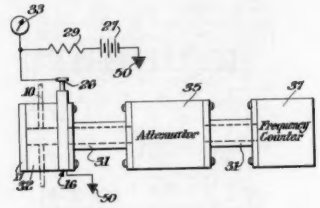
Filed Apr. 13, 1979, Ser. No. 29,676
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58.5 C **34 Claims**

1. Apparatus for the measurement of a plurality of physical properties of an object comprising:

(a) resonant structure means which when properly energized responds with perturbed and unperturbed resonant oscillations with characteristics comprised of frequencies, amplitudes, phases, and polarizations;

(b) means for providing a plurality of relative polarizations between the oscillations of the resonant structure means and the object measured;

(c) energy source capable of energizing the oscillations of the resonant structure means at frequencies at which said structure means is resonant;



(d) means for communicating energy between said energy source and the resonant structure means to energize the resonant oscillations;

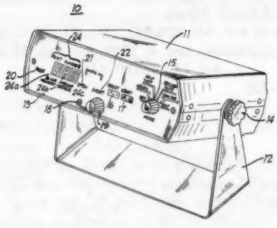
(e) means for communicating energy at a plurality of relative polarizations between said energized resonant structure means and the object whose properties are to be measured so that the resonant oscillations become perturbed;

(f) detection means responsive to the characteristics of the resonant oscillations of the resonant structure means that is representative of the plurality of properties of the object measured.

4,257,002
AUTOMATIC HARNESS TESTER

William E. Helms, Orange, and Jack W. Adams, Alta Loma, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 11, 1978, Ser. No. 968,820
Int. Cl.³ G01R *19/00*
U.S. Cl. 324—66 **35 Claims**



1. Apparatus for storing the circuit conditions existing between a plurality of end points established by the conductors of a known multiconductor harness, said apparatus comprising:

storage means for storing information representative of circuit conditions existing between said plurality of points established by the conductors of said known multiconductor harness;

testing means for applying a signal to said plurality of points;

detection means responsive to said signal for determining the existence of circuit conditions existing between said plurality of points;

transfer means responsive to said detection means for transferring information representative of said circuit conditions of the conductors of said known multiconductor harness to said storage means; and

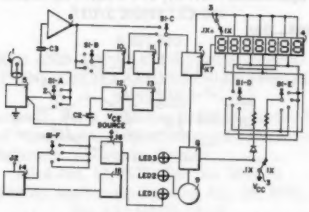
means responsive to data stored in said storage means for generating frequency shift keyed signals in serial fashion representative of the data in said storage means to facilitate transfer of said data to a storage device.

4,257,003

WIDE RANGE FREQUENCY COUNTER

George M. Yool, Tempe, Ariz., assignor to Ma-West, Inc., Apache Junction, Ariz.

Filed Apr. 4, 1978, Ser. No. 893,497
Int. Cl.³ G01R *23/02*
U.S. Cl. 324—78 D **31 Claims**



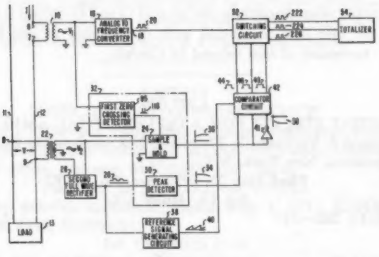
1. A frequency counter comprising, in combination, a display; frequency counting means connected to said display for counting the frequency of input signals applied to said frequency counter; and control means coupled to said display and said frequency counting means for automatically blanking out said display when there is no input signal applied to said frequency counter and also for permitting said display to display the frequency of said input signal only when an input signal is actually applied to said frequency counter.

4,257,004

ELECTRICAL ENERGY MEASURING MULTIMETER

Robert C. Miller, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1978, Ser. No. 972,164
Int. Cl.³ G01R *7/00*
U.S. Cl. 324—141 **18 Claims**



1. An electrical energy measuring circuit multiplying a first and second analog input signals, comprising:

first input means receiving said first analog input signal;

second input means receiving said second analog input signal;

analog to frequency converter means producing a train of pulse signals having a pulse repetition rate responsive to the peak values of said first analog input signal;

means for sampling said second analog input signal at predetermined times, and having output means producing at least one analog output signal responsive to said second analog input signal;

means producing a periodic reference signal;

means for comparing the instantaneous values of said reference signal to the instantaneous values of said at least one analog output signal;

totalizing means; and

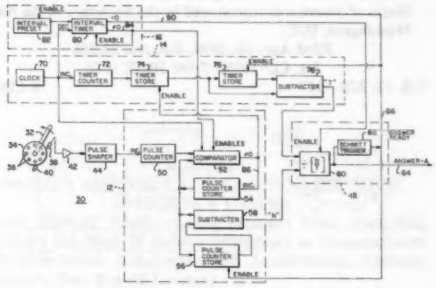
switching means selectively connecting said analog to frequency converter means to said totalizing means, said switching means responsive to said means for comparing such that the total of pulse signals stored in said totalizing means is related to the time integral of the product of said first and said second analog input signals.

4,257,005

FIXED INTERVAL VARIABLE PERIOD PULSE RATE MEASURING METHOD AND SYSTEM AND TACHOMETER SYSTEM USING SAME

David S. Hall, 238 Calvary St., Waltham, Mass. 02154

Filed May 23, 1979, Ser. No. 41,686
Int. Cl.³ G01P *3/48, 3/54*
U.S. Cl. 324—166 **13 Claims**



1. A fixed interval, variable period pulse rate measuring system comprising:

a control circuit for defining a measuring interval and indicating the start and stop of said interval;

a counter circuit responsive to a start indication from said control circuit for beginning to count pulses and responsive to a stop indication to cease counting pulses;

a timer circuit for defining the beginning of a measuring period in response to said first counted pulse and the end of a measuring period in response to said last counted pulse; and

means, responsive to a said stop indication, for determining pulse rate from the number of pulses counted by said counter circuit during said measured period and the time of said measured period.

4,257,006

INTEGRABLE ANALOG ACTIVE FILTER AND METHOD OF SAME

Rolf Schaumann, Minnetonka, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

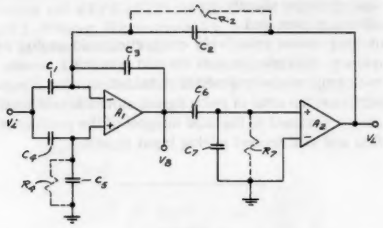
Filed Jan. 25, 1979, Ser. No. 6,438
Int. Cl.³ H03B *1/04;* H03F *1/08, 1/56;* H03H *2/00*
U.S. Cl. 328—127 **8 Claims**

1. An active analog filter consisting, essentially, in combination;

input and output terminals adapted for connection to a source of signal and signal utilization means; and

integrating means effectively free of resistors in performing

the integrating operation interconnecting said input and output terminals, said integrating means including amplifier means and reactance means exhibiting resistorless capacitance characteristics.

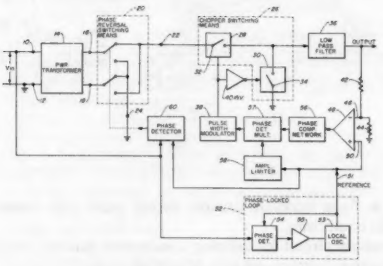


4,257,007

ACTIVE HIGH-POWER BANDPASS FILTER

James L. Brooks, Oxnard, Calif.; James C. Bowers, and Harry A. Nienhaus, both of Tampa, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1979, Ser. No. 30,586
Int. Cl.³ H03L 7/06; H03K 9/08
U.S. Cl. 328—167 **8 Claims**



1. An active high power filter comprising:

means for chopping an input signal having a primary component of a first frequency at a chopper frequency to provide a chopped signal at an output, said means for chopping being controllable for adjusting the duty cycle of the chopped output signal;

filter means having its input coupled to the output of said means for chopping for receiving the chopped output signal and having an output, said filter means filtering the chopper frequency and allowing the passage of the first frequency of said chopped output signal to the output of said filter;

means for providing a reference signal at the frequency of and in-phase with the primary component of said input signal;

differential amplifier means having a first input coupled to the output of said filter means, a second input coupled to said reference signal, and an output, said differential amplifier means providing a signal related to the difference between its two inputs at its output;

phase compensation means coupled to the output of said differential amplifier means for adjusting the phase of the output signal from said differential amplifier means;

phase detection multiplier means having a first input coupled to the output of said phase compensation means, a second input coupled to the reference signal, and an output, said phase detection multiplier providing an output signal related to the difference between its input signals; and

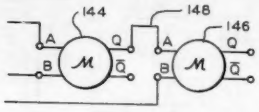
pulse-width-modulator means having its control input coupled to the output of said phase detection multiplier means and its output coupled to said means for chopping to control the duty cycle of said means for chopping, the duty cycle of said pulse-width-modulator means being controlled by the output signal from said phase-detection multiplier.

4,257,008

LOGIC CIRCUIT BUILDING BLOCK AND SYSTEMS CONSTRUCTED FROM SAME

Joseph Shepter, New Haven, Conn., assignor to Scientific Circuitry, Inc., Norwalk, Conn.

Division of Ser. No. 382,981, Jul. 26, 1973, abandoned. This application Nov. 17, 1977, Ser. No. 852,594
Int. Cl.³ H03K 3/037
U.S. Cl. 328—206 **6 Claims**



1. A logic system comprising first and second identical logic circuit building blocks, each referred to as an M Circuit, which responds to transitions of a two level, binary input signal to provide a memory and a logic function which has a complete truth table for every possible combination of input signal transitions or changes in logic level at a pair of input terminals A and B, each of said M Circuits comprising:

gating means having two inputs connected to said A and B input terminals, respectively; and

a set-reset flip flop means having its set input connected to the output of said gating means, its reset input connected to said B input terminal and its set and reset outputs connected respectively to output terminal Q and $\overline{Q}$ of said M Circuit, said Q and $\overline{Q}$ output terminals providing complementary binary outputs for any combination of binary inputs applied at said A and B input terminals, whereby said M Circuit is a four terminal device which responds to each transition of said input signal at said A and B terminals to provide outputs at said Q and $\overline{Q}$ terminals in accordance with its truth table function; and

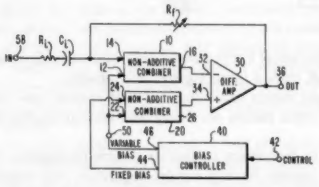
means interconnecting one of said Q and $\overline{Q}$ output terminals of said first M Circuit with one of said A and B input terminals of said second M Circuit.

4,257,009

INHIBIT CIRCUIT FOR A DIFFERENTIAL AMPLIFIER

Bernard J. Yorkanis, S. Plainfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 23, 1979, Ser. No. 41,752
Int. Cl.³ H03F 3/45
U.S. Cl. 330—51 **2 Claims**



1. An inhibit circuit for a differential amplifier, comprising:

a pair of non-additive combiners, each having an output connected to a respective input of said amplifier;

input means for selectively coupling a signal to be amplified to a given input terminal of one of said combiners;

a bias controller having a first output for producing a fixed bias voltage and a second output for producing a variable bias voltage, said bias controller having an input responsive to a control signal supplied thereto for controlling the polarity of said variable bias voltage relative to said fixed bias voltage;

first means for applying said variable bias voltage to a first input of each of said combiners;

second means for applying said fixed bias voltage to a second input of one of said combiners; and

a feedback resistor connected between said output of said differential amplifier and said second input of said other of said combiners.

4,257,010

METHOD AND APPARATUS FOR SENSING AND MAINTAINING OSCILLATIONS IN AN OSCILLATING SYSTEM

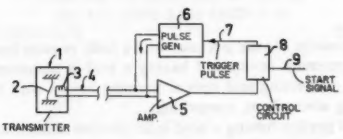
Sven A. Bergman; Per J. Ohlsson, and Karl-Gustav E. Nordqvist, all of Nynäshamn, Sweden, assignors to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden

Filed Jan. 19, 1977, Ser. No. 760,800

Claims priority, application Sweden, Jan. 28, 1976, 7600912

Int. Cl.³ G05D *19/02*

U.S. Cl. 331—65 **11 Claims**



5. A signal transmitter comprising an oscillatory system, means for affecting the oscillation frequency of said system in response to influence by the magnitude of a measured condition which magnitude is to be transmitted, means for sensing the oscillatory state of the system, and means for delivering energy to said system, said sensing means and said energy delivery means each being connected to said oscillatory system by means of substantially the same signal path, said energy delivery means comprising a pulse generator controlled by a control means to deliver said energy in the form of pulses at time intervals longer than a whole period of oscillation in said system to maintain said system in a state of oscillation.

4,257,011

SEMICONDUCTOR LASER DEVICE

Michiharu Nakamura, Hinodemachi; Shigeo Yamashita, Hachioji; Takao Kuroda, Kokubunji, and Jun-ichi Umeda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 28, 1978, Ser. No. 929,013

Claims priority, application Japan, Aug. 1, 1977, 52-91368; Mar. 24, 1978, 53-36912[U]

Int. Cl.³ H01S *3/19*

U.S. Cl. 331—94.5 H **30 Claims**

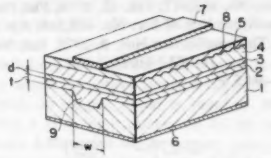
1. A semiconductor laser device comprising:

a first semiconductor layer;

second and third semiconductor layers which sandwich said first semiconductor layer therebetween, which have a greater band gap and lower refractive index than said first semiconductor layer and which have conductivity types opposite to each other;

at least one of said second and third semiconductor layers having a protuberant region which extends in the traveling direction of a generated laser beam and in the shape of a stripe on its surface side remote from said first semiconductor layer;

a semiconductor layer disposed with portions lying on both sides of said protuberant region and which makes the effective complex refractive index for said laser beam discontinuous in a direction perpendicular to said traveling direction of said laser beam;



periodic corrugations formed in at least one interface of the semiconductor layers constituting said semiconductor laser device, in a manner to intersect orthogonally to the lengthwise direction of the stripe of said protuberant region to include at least a region corresponding to the stripe-shaped region of said protuberant region.

4,257,012

NOZZLE ASSEMBLY FOR GAS-DYNAMIC HIGH EFFICIENCY LASERS

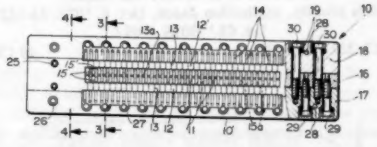
Werner Malburg, Neubiberg, and Friedbert Mohr, Zorneding, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1978, Ser. No. 945,832

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2745001

Int. Cl.³ H01S *3/02*

U.S. Cl. 331—94.5 D **10 Claims**



1. A nozzle assembly for a gas-dynamic, high efficiency, continuously operable laser, comprising nozzle means including a plurality of nozzle members (**11**), each nozzle member (**11**) comprising a laser gas input end and a nozzle output end as well as nozzle throat means (**15, 15'**) intermediate said ends, said input end comprising spacer body means (**12**) including contact surfaces (**13**) and individual coolant flow means (**14, 14*a***) in each input end of each nozzle member, said coolant flow means including extension means (**14*b***) located in said nozzle members so that coolant may flow substantially along said nozzle throat means (**15, 15'**), each of said coolant flow means being supplied with fresh coolant independently of the coolant supply to any other coolant flow means of the assembly, and mounting means (**16, 17, 18**) for holding said plurality of nozzle members (**11**) as an assembly so that adjacent spacer body means abut each other at said contact surfaces in a heat conducting manner.

4,257,013

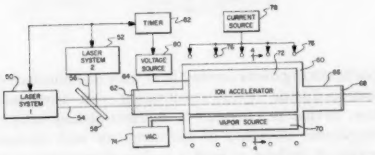
ADIABATIC INVERSION FOR SELECTIVE EXCITATION

Charles T. Pike, Lexington; Horace W. Furumoto, Wellesley, both of Mass., and Lawrence A. Levin, Beer Sheva, Israel, assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Division of Ser. No. 483,077, Jun. 25, 1974, Pat. No. 4,156,144, which is a continuation of Ser. No. 465,264, Apr. 29, 1974, abandoned. This application Nov. 8, 1978, Ser. No. 958,623

Int. Cl.[2] H01S *3/091*

U.S. Cl. 331—94.5 P **3 Claims**



1. A method for generating laser radiation of high photon energies comprising the steps of:

applying radiant energy of swept frequency to an environment of particles for lasing to create an adiabatic inversion of the energy states of particles in said environment;

exciting the adiabatically inverted particles to higher energy levels with respect to the energy level from which they were inverted;

the particles excited to said higher energy states populating those energy states in greater percentages than in the initial energy state from which the particles were adiabatically inverted;

particles in said higher energy states decaying to said initial energy state with the emission of a high energy photon.

4,257,014

GAS LASER DISCHARGE TUBE USING CORRUGATED CATHODE

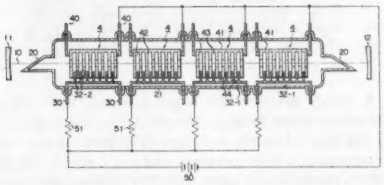
Shuzo Hattori, Nagoya; Noboru Kamide, Tokyo; Katumi Tokudome, Hidaka; Michio Ishikawa, Kawagoe, and Yuzi Hayashi, Niiza, all of Japan, assignors to Kimmon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1978, Ser. No. 966,857

Claims priority, application Japan, Oct. 6, 1978, 53-122724

Int. Cl.[3] H01S *3/097*

U.S. Cl. 331—94.5 PE **10 Claims**



1. A gas laser system comprising:

a generally tubular discharge vessel filled with a discharge gas for producing a laser active medium to be excited by discharge;

an optical cavity for amplifying stimulated emissions transmitted from said laser active medium, the optical cavity defining an optical axis;

a plurality of discharge cathodes in said discharge vessel, each comprising a corrugated hollow cylinder through which runs said optical axis;

a plurality of discharge anodes each having a plurality of anodic surfaces, each anodic surface being located between two adjacent corrugations of the discharge cathode; and

a power source for applying voltage between each discharge cathode and the adjacent discharge anode to thereby achieve gas laser discharge.

4,257,015

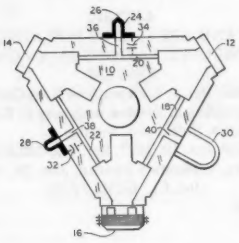
RING LASER GYROSCOPE ANODE

Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Mar. 26, 1979, Ser. No. 23,980

Int. Cl.[3] H01S *3/083*

U.S. Cl. 331—94.5 D **8 Claims**



1. An anode, for use in a laser with a body portion having an optical resonant cavity and having a lead-in communication passage connecting said optical resonant cavity with the surrounding atmosphere, comprising:

a head portion having a head inner portion and a head outer portion;

said head outer portion being arranged to engage said laser body portion for its support and for sealing off the surrounding atmosphere from the resonant cavity;

said head inner portion being adapted to connect to a conductor to receive an electric potential;

a stem portion disposed in said passage and fixedly connected to said head inner portion for electric contact therewith; and

a discharge end portion disposed in said passage proximate to said optical cavity and fixedly connected to said stem portion for electric contact therewith; wherein

said head outer portion is a dielectric disc, and said head inner portion extends through said disc.

4,257,016

PIEZO-OPTIC, TOTAL INTERNAL REFLECTION MODULATOR

Charles J. Kramer, Jr., Pittsford, and Ned J. Seachman, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1979, Ser. No. 13,709

Int. Cl.[3] H01S *3/10*; G02F *1/33*

U.S. Cl. 332—7.51 **10 Claims**

1. A piezo-optical modulator comprising:

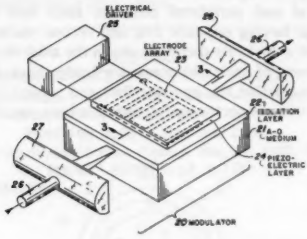
an acousto-optical interaction medium;

a transducer means disposed above a surface of said interaction medium, said transducer means comprising a spatially periodic interdigital electrode array and further including a piezoelectric layer overlying said array,

electrical driver means for developing in said piezoelectric layer a periodic alternating strain field which is propagated in parallel fashion into the interaction medium to form a shallow strain diffraction grating immediately adjacent said medium surface, and

means for directing a light beam into said medium such that

the beam is totally internally reflected at said surface and within said grating whereby a portion of said light beam is



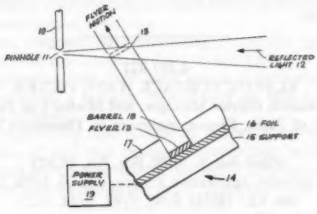
diffracted into at least one side order in accordance with the frequency of the alternating strain field.

4,257,017

POST PULSE SHUTTER FOR LASER AMPLIFIER

Laird P. Bradley, Livermore; Bruce M. Carder, Antioch, and William L. Gagnon, Berkeley, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 11, 1978, Ser. No. 923,753
Int. Cl.³ H01S *3/10*; G02B *5/23*
U.S. Cl. 332—7.51 **3 Claims**



2. A retropulse shutter for preventing laser light passing through an aperture in a light transmitting component of a laser system from being reflected back through said aperture comprising: an assembly capable of ejecting a projectile across a beam path from said light transmitting component to block the reflected light from passing back through said aperture of said light transmitting component, said assembly including a vaporizable material consisting of a foil member, and means for vaporizing said material such that a plasma formed by vaporization of said material is utilized for ejecting the projectile across the beam path to obstruct reflected light from passing through said aperture of said light transmitting component.

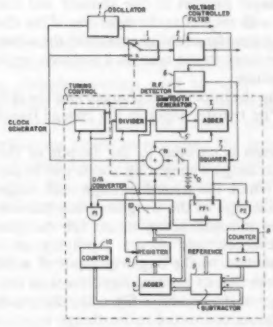
4,257,018

AUTOMATIC TUNING CIRCUITS FOR VOLTAGE CONTROLLED FILTERS, BY DIGITAL PHASE CONTROL

Arturo Masdea, and Giuseppe Quagliarello, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Italy

Filed Apr. 4, 1979, Ser. No. 26,973
Claims priority, application Italy, Apr. 18, 1978, 48946 A/78
Int. Cl.³ H03H *17/02*
U.S. Cl. 333—17 R **1 Claim**

1. A circuit for automatically tuning a voltage controlled filter to which the output of an oscillator is applied, said circuit comprising a clock generator for generating clock pulses; a divider circuit connected to the clock generator output for dividing the clock pulses to provide a square wave signal at a lower frequency; a sawtooth circuit connected to receive the square wave signal and to transform the same into a sawtooth signal; a first adder circuit having a first input connected to receive the sawtooth signal, a second input, and an output adapted for connection to the voltage controlled filter for scanning the response of the filter; a radio frequency detector adapted for connection to the output of the filter; a squaring circuit connected to said detector for squaring the output thereof; a switching circuit capable alternatively of assuming a first state in which an output signal is supplied and a second state in which no output signal is supplied, said switching circuit having a first input connected to the output of said divider circuit for receipt of the square wave signal and a second input connected to the output of said squaring circuit for receipt of the squared output, said switching circuit responsive to a signal at its first input for assuming its first state and responsive to a signal at its second input for assuming its second state; a first gating circuit having a first input connected to said clock generator output and a second input connected to said switching circuit output and responsive to simultaneous signals at its first and second inputs for generating an output signal; a first counting circuit connected to the output of said

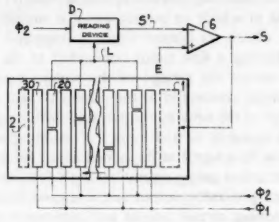


first gating circuit; a second gating circuit having a first input connected to said clock generator output and a second input connected to said squaring circuit for receipt of the squared output and responsive to simultaneous signals at its first and second inputs for generating an output signal; a second counting circuit connected to the output of said second gating circuit; a divide by two circuit having an input connected to the output of said second counter; a subtractor circuit having a first input connected to the output of said first counting circuit and a second input connected to the output of said divide by two circuit; a second adder circuit having a first input connected for receipt of the output of said subtractor circuit, a second input, and an output; a register having a first input connected to said second adder circuit output, a second input connected to the output of said divider circuit, and an output connected to said second adder circuit second input; a digital-to-analog converter having an input connected to the output of said register and an output; a third adder circuit having a first input connected to the output of said digital-to-analog converter, a second input adapted for connection to the oscillator, a third input adapted for connection to a source of frequency offset voltage, and an output connected to the second input of said first adder circuit.

4,257,019
CHARGE TRANSFER RECURSIVE FILTER

Roger B. Gonin; Sylvain Fontanes, and Jean E. Picquendar, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 21, 1979, Ser. No. 96,327
Claims priority, application France, Nov. 21, 1978, 78 32766
Int. Cl.[3] **H03H** *15/02, 17/04;* **H11C** *19/28*
U.S. Cl. 333—165 **3 Claims**



1. A recursive filter for the transfer of electrical charges comprising:

a shift register for the transfer of electrical charges having a pluraity of stages, said register being realised on a semiconductor substrate covered by an insulating layer, transfer electrodes constituting its stages being arranged on the insulating layer parallel to one another and transversely positioned with respect to the direction of the charges and ensuring the transfer of the charges into the substrate from one register stage to the next on a periodic application of given potentials;

means ensuring the injection of charges into the shift register located at the register input in the charge transfer direction;

weighting means connected to the output of the register stages which assign a weighting coefficient to the quantity of charges which has passed through each stage;

means fixing the sign of the weighting coefficients;

reading means and summation means for the quantities of weighted charges, said means supplying an electrical signal transmitted to the negative input of a differential amplifier, which at its positive input receives the sampled input voltage of the recursive filter, the differential amplifier output being connected to the charge injection means;

means ensuring the discharge of charges which have passed through the final register stage; wherein the electrical output signal of the recursive filter is taken, under a low impedance, at the output of the differential amplifier.

4,257,020
PIEZOELECTRIC RESONATOR

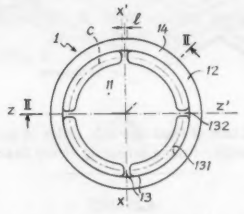
Raymond J. Besson, Besancon, France, assignor to Etat Francais represente par le Delegue General Pour l'Armement, Paris, France

Filed Jan. 15, 1979, Ser. No. 3,907
Claims priority, application France, Jan. 27, 1978, 78 02261
Int. Cl.[3] **H03H** *9/13, 9/15;* **H01P** *7/06*
U.S. Cl. 333—187 **15 Claims**

1. A UHF resonator comprising:

a re-entrant cavity including a closed portion of coaxial line having a closed end and a central conductor which is interrupted at one end thereof so as to form a small gap between the one end of the central conductor and the closed end of the line, wherein an electical field is created therebetween; and

a piezoelectric crystal extending in mutually perpendiclar axial and radial directions interposed in said gap, the crystal including a central portion having a first set of opposite first and second surfaces; a peripheral portion having a second set of opposite first and second surfaces; an intermediate zone formed of a cavity separating said central and peripheral portions, said zone having a relatively small radial dimension in respect to the radial dimension of said crystal; and a plurality of connector bridges spaced apart in said zone and interconnecting said central and peripheral portions, each said connector bridge having opposite first and second surfaces which define a thickness therebetween in the axial direction, the thickness of each said connector bridge having a dimension such that the opposite first and second surfaces of each said connector bridge and of at least one of said first

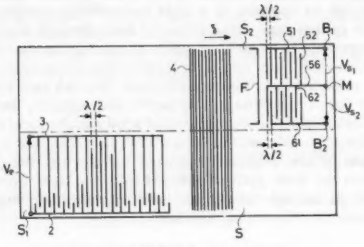


and second sets together form first and second uniform continuum surfaces, respectively, whereby tangents to said first surfaces of each said connector bridge and of said at least one of said first and second sets are situated in a first plane at the points of contact therebetween and tangents to said second surfaces of each said connector bridge and of said at least one of said first and second sets are situated in a second plane at the points of contact therebetween.

4,257,021
ELASTIC SURFACE WAVE FILTER

Gerard Coussot; Olivier Menager, and Michel Van Den Driessche, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 6, 1979, Ser. No. 45,923
Claims priority, application France, Jun. 6, 1978, 78 16868
Int. Cl.[3] **H03H** *9/68, 9/42, 9/64, 9/25*
U.S. Cl. 333—195 **6 Claims**



1. An elastic surface wave filter comprising:

a piezoelectric plate of which one of the faces is divided into a first and a second halves by an imaginary line parallel to a direction z,

an emitting transducer located in said half and emitting elastic surface waves in said direction z,

receiving means located in said second half for converting elastic energy into electric energy, and

a coupler extending over said two halves, interposed between said emitting transducer and said receiving means and directing the elastic surface waves emitted by said emitting transducer towards said receiving means;

said receiving means comprising two transducers each having a first and a second terminal, the first terminals of said

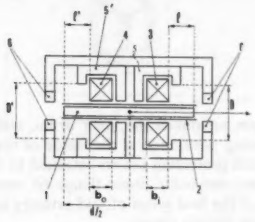
two transducers being common, the voltages between the first and second terminals induced by a surface wave, being of equal amplitude and in phase opposition in the transmission band of the filter.

4,257,022

MAGNETOSTRICTIVE ROD FILTERS

Rene G. Deschamps, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Jan. 9, 1979, Ser. No. 2,102
Claims priority, application France, Jan. 11, 1978, 78 00709
Int. Cl.³ H03H *9/62, 9/135*
U.S. Cl. 333—201 **3 Claims**



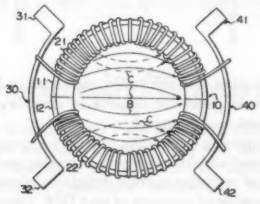
1. A magnetostrictive rod filter comprising:
a freely vibrating magnetostrictive rod;
an input winding and an output winding placed on either side of the center of and surrounding said rod;
ferrimagnetic material sheaths respectively surrounding said input and output windings;
permanent magnetic field producing means for applying a longitudinal d.c. magnetic field to said rod;
a demagnetizing field producing means at each end of said rod inducing a voltage respectively in said input and output winding;
said demagnetizing field producing means consisting of the portions of said rod externally projecting beyond said windings and by apertures in the part of said ferrimagnetic material sheaths facing the projecting portions of said rod.

4,257,023

DEFLECTING DEVICE FOR CATHODE-RAY TUBE

Naoyoshi Kamijo, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 20, 1978, Ser. No. 962,480
Claims priority, application Japan, Nov. 29, 1977, 52-142185
Int. Cl.³ H01F *3/12*
U.S. Cl. 335—211 **8 Claims**



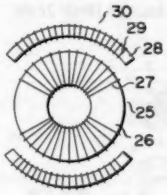
1. A deflecting device for cathode-ray tube having a screen comprising deflection means to be mounted on said cathode-ray tube and including a vertical deflection means for causing deflection along an axis by generating a vertical deflection magnetic field, and means for picking up leakage fluxes generated from said vertical deflection means and passing the leakage fluxes directly from a first to a second position, and from a third to a fourth position, said first and second positions corresponding to the two corners of said screen nearest one end of said axis, and said third and fourth positions corresponding to the other two corners of said screen, thereby deforming towards a pincushion-distributed vertical deflection magnetic field that portion of said vertical deflection magnetic field which is generated in a position corresponding to the cone portion of said cathode-ray tube.

4,257,024

COLOR PICTURE TUBE APPARATUS

Taketoshi Shimoma, Isezaki; Kumio Fukuda, and Michio Nakamura, both of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 14, 1979, Ser. No. 75,677
Claims priority, application Japan, Sep. 20, 1978, 53/114680
Int. Cl.³ H01F *7/00*
U.S. Cl. 335—213 **7 Claims**



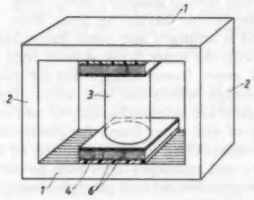
1. A color picture tube apparatus comprising:
a color picture tube including an in-line type electron gun and a phosphor screen with phosphor layers each of which emits red, green and blue light when three electron beams from the electron gun impinge upon it; and
beam deflecting means surrounding the color picture tube and including a horizontal deflection coil for generating a horizontal deflection magnetic field, a vertical deflection coil and correction coils, said vertical deflection coil and correction coils cooperating to generate a vertical deflection magnetic field, the distribution of said horizontal magnetic field being barrel-shaped on the electron gun side and pincushion-shaped on the phosphor screen side and, as a whole, pincushion-shaped, and the distribution of said vertical deflection magnetic field being barrel-shaped on the electron gun side and pincushion-shaped on the phosphor screen side and, as a whole, barrel-shaped.

4,257,025

LAMINATED METALLIC PLATES FOR SUPPORTING CORE LEG IN INDUCTIVE ELECTRICAL DEVICES TO DETERMINE MAGNETIC CIRCUIT

Ingvar Hareland, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jun. 11, 1979, Ser. No. 47,643
Claims priority, application Sweden, Jun. 12, 1978, 7806753
Int. Cl.³ H01F *27/24*
U.S. Cl. 336—84 M **4 Claims**



1. In an inductive electrical device which includes a main

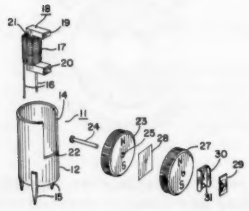
magnetic circuit having spaced apart laminated magnetic yokes of substantially rectangular cross-section and at least one magnetic core leg positioned therebetween, each said core leg being of substantially circular cross-section and being wrapped with a winding, the improvement wherein a separate cross-flux plate is positioned between the opposite ends of each said core leg and the adjacent yoke, each cross-flux plate comprising laminations of elongated magnetic sheets which extend in a direction substantially perpendicular to the direction of laminations of said yokes and such that each plate covers at least the cross-section of said core leg and the width of said respective yoke.

4,257,026

ADJUSTABLE LINEARITY COIL ASSEMBLY

Ted S. Zelazo, Chicago, and Thomas J. Wright, Itasca, both of Ill., assignors to Bel-Tronics Corporation, Addison, Ill.

Filed Oct. 9, 1979, Ser. No. 82,636
Int. Cl.[3] H01F *21/06*
U.S. Cl. 336—90 **3 Claims**



1. An adjustable linearity coil assembly for use such as with a cathode ray picture tube comprising, in combination, an essentially C-shaped core, a coil wound on said core, a first permanent magnet stationarily mounted on the free ends of said C-shaped core, a second permanent magnet, a nonmagnetizable casing, terminal pins mounted on the casing, at least two of said pins being connected with said coil for providing electrical connection means to asociated electronic circuitry, said casing including an elongated opening therein, and said core being positioned in said casing and having the free ends of the C-shape core extending outwardly through said opening, said first permanent magnet being affixed to said casing and to the free ends of said core, and a mounting shaft for mounting said second magnet in rotatable relation to said first magnet, whereby rotation of said second magnet varies the permeability of said core to thereby provide an adjustable linearity coil.

4,257,027

TRANSFORMER BOBBIN ASSEMBLY

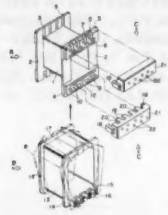
Saburo Yasuhisa, Tokyo, Japan, assignor to Shimoda Electric Company, Tokyo, Japan

Filed May 21, 1979, Ser. No. 40,574
Claims priority, application Japan, Nov. 27, 1978, 53-146268
Int. Cl.[3] H01F *15/10, 27/30*
U.S. Cl. 336—192 **6 Claims**

1. A transformer bobbin assembly comprising:

an outer frame bobbin having an inner drum on which a primary coil is arranged and outer frame flanges formed integrally with the inner drum at both ends of the inner drum, said outer frame flanges having guide slots or grooves through which the lead wires of primary and secondary coils are extended axially of said outer bobbin, at least one of said outer frame flanges having pin holes into which connecting pins are inserted to interconnect said primary and secondary coils with an outside circuit, said slots or grooves and said pin holes being located in a closely spaced relation,

an inner frame bobbin having an outer drum on which a secondary coil is arranged and inner frame flanges formed integrally with the outer drum at both ends of the outer drum, said inner frame flanges having guide grooves through which lead wires of the secondary coil are extended axially of said inner bobbin, said outer drum of the inner frame bobbin being located in coaxial alignment with the inner drum of the outer frame bobbin so that the



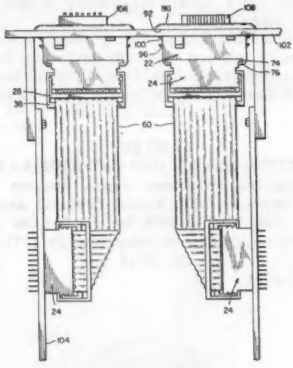
outer drum surrounds the inner drum, said inner frame flanges being positioned at the inside of the outer frame flanges, and protection covers attached to the outside of the at least one outer frame flange to cover connected portions of the lead wires of said primary and secondary coils to the outside circuit.

4,257,028

REMOTE SOCKET FOR DIP COMPONENTS

Ronald S. Narozny, Panorama City, and Albert H. Wilson, Los Angeles, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Jun. 27, 1979, Ser. No. 52,630
Int. Cl.[3] H01R *11/20;* H02B *1/04;* H05K *7/10*
U.S. Cl. 339—126 R **3 Claims**



1. In combination, for releasably mounting a DIP component in a console panel for control of circuitry located remotely from said console panel:

a socket comprising a retaining portion for mounting to said console panel and for releasably receiving such DIP component, said retaining portion defining a plurality of openings for passage of contacts of said DIP component therethrough and therebeyond;

an electrical connector having a body secured to said retaining portion and supporting contact elements in registry with said openings, each said contact element having a first end contact in interference disposition to such opening to compliantly electrically engage such DIP contact and a second end contact of insulation-piercing character and extending outwardly of said body; and

a flat cable having multiple conductors, each conductor

thereof being in insulation-pierced electrical connection with a distinct one of such connector second end contacts and in further electrical connection with said circuitry located remotely from said console panel.

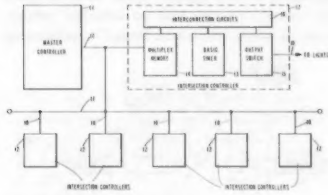
4,257,029
TRAFFIC CONTROL SYSTEM

Carlile R. Stevens, 468 El Rio Rd., Danville, Calif. 94526

Division of Ser. No. 536,465, Dec. 26, 1974, Pat. No. 4,085,434, and Ser. No. 302,041, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 5,068, Jan. 22, 1970, abandoned. This application Apr. 13, 1978, Ser. No. 896,217

Int. Cl.³ G08G *1/07, 1/097*

U.S. Cl. 340—40 **35 Claims**



1. A traffic control system comprising a central station, a plurality of local stations each disposed for energizing traffic signals in a prescribed pattern to control traffic by performing control operations, and a multiplex communication system connecting said central station with each of said local stations for establishing communication from said central station to said local stations under control of said central station said multiplex system including means at said central station for generating a plurality of words having a fixed time relationship to one another, with a number of successive word positions constituting a frame and with each of said words being divided into time spaced portions each disposed for the transmission of an information element, the first of said elements in each word being a marker element and subsequent elements being data elements, said multiplex system including means at each of said local stations for selecting a word having a particular word position within each frame in response to the receipt of a marker element in that word position from said generating means, said selecting means including means for sensing the presence of a data element in the selected word and for generating a signal in response thereto containing information corresponding to a control operation of said local stations, each of said local stations includes circuit means for performing a specified control operation related to the energization of the traffic signals, and means connecting said signal from said sensing means to said circuit means to establish said specification control operation thereof.

4,257,030
ELECTRONICALLY CODED CYLINDER LOCK AND KEY

Rolf Bruhin, Wetzikon, and Peter Rütimann, Effretikon, both of Switzerland, assignors to Bauer Kaba AG, Switzerland

Filed Mar. 21, 1979, Ser. No. 22,626

Claims priority, application Switzerland, Mar. 29, 1978, 3359789/78

Int. Cl.³ E05B *47/06;* G06K *7/08*

U.S. Cl. 340—149 R **9 Claims**

1. An improved lock and key combination wherein the key is insertable in the lock and has coded information for identification and control of access of the key, comprising

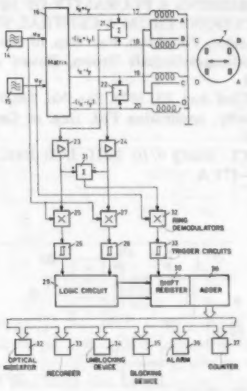
an information carier mounted on said key comprising

an electrically nonconductive and magnetically conductive substrate, and

an electrically conductive pattern means carried by said substrate for carrying a code containing desired information;

a reading device positioned in the lock;

electronic control circuit means coupled to said reading device for producing an alternating magnetic field to



generate an electric alternating current in said pattern means; and

electronic evaluation circuit means coupled to said reading device for receiving feedback signals representation of said alternating current for recognition of said key.

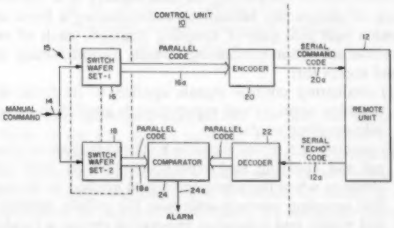
4,257,031
DIGITAL REMOTE CONTROL SYSTEM

Ernest O. Kirner, Coral Springs, and Walter L. Devensky, Boca Raton, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 18, 1979, Ser. No. 58,572

Int. Cl.³ H04Q *9/00;* G08B *23/00*

U.S. Cl. 340—149 R **13 Claims**



1. A digital system for controlling a remote unit from a control point in accordance with a command, comprising:

encoder means having at least first and second redundant and simultaneously manipulated encoders for reducing said command to first and second identical digital signals respectively in said first and second encoders;

means for transmitting said first digital signal in serial-by-bit format to said remote unit;

means for receiving and storing said first digital signal at said remote unit, said first digital signal being used to control said remote unit;

means for transmitting the first digital signal back from said remote unit to said control point;

means for receiving said first digital signal at said control point; and,

means for comparing said second digital signal with the digital signal received at said control point, an unfavor-

able comparison indicating a fault or failure in said digital system.

4,257,032

CIRCUIT AND PROCESS FOR AUTOMATICALLY ADDRESSING A PLURALITY OF MOBILE SUBSTATIONS FROM A CENTRAL STATION

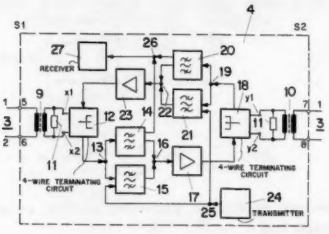
Rüdiger Schneider, Viernheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Aug. 23, 1978, Ser. No. 936,096

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739305

Int. Cl.[3] **H04Q** *9/10;* **B61L** *3/00;* **B61C** *3/00*

U.S. Cl. 340—171 A **9 Claims**



1. Apparatus for automatically addressing a plurality of mobile substations from a mobile central station, comprising:

(A) a central station processing circuit located at said central station and including a pair of coupling contacts, said central station processing circuit including first means for:

(1) generating command signals in a first frequency channel and applying said command signals to said central station coupling contacts; and

(2) receiving and processing report signals applied to said central station coupling contacts;

(B) a plurality of mobile substation processing circuits equal in number to a number of said mobile stations, each of said mobile station processing circuits located at a different one of said mobile substations and including a front side and a rear side pair of coupling contacts, each of said mobile substation processing circuits also including second means for:

(1) evaluating control signals applied to its front side coupling contacts and report signals applied to its rear side coupling contacts;

(2) generating a report signal in a second frequency channel and applying said report signal to its front side contacts when the command signal applied to its front side coupling contacts addresses the mobile substation and which said substation processing circuit is located;

(3) reproducing said control signal applied to its front side contacts when the command signal applied to its front side contact addresses a mobile station other than the mobile station at which said substation processing circuit is located and applying said reproduced control signal to its rear side contacts; and

(4) reproducing said report signals applied to its rear side coupling contacts and applying said reproduced report signals to its front side coupling contacts;

(C) a plurality of two wire lines equal in number to the number of said mobile substations, one end of each of said two wire lines being electrically coupled to a different pair of said front side coupling contacts, the remaining end of each of said two wire lines being electrically coupled to either a different pair of said rear side coupling contacts or to said central station coupling contacts in such a manner that each of said substation processing circuits are coupled in series with both the remaining said substation processing circuits and with said central station processing circuit; and

(D) each of said mobile substation processing circuits adapted to galvanically separate its front side coupling contacts from its rear side coupling contacts.

4,257,033

FAULT LOCATING SYSTEM IN OPTICAL FIBER TRANSMISSION SYSTEM

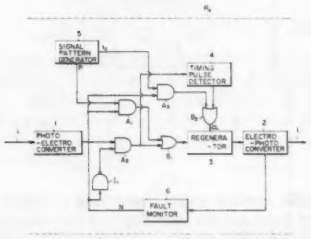
Chuichi Ota, Fuchu; Norio Seki, and Haruo Sakaguchi, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1979, Ser. No. 62,981

Claims priority, application Japan, Aug. 7, 1978, 53-95411

Int. Cl.[3] **H04B** *9/00;* **G08C** *25/00, 19/36*

U.S. Cl. 340—870.16 **3 Claims**



2. In an optical digital signal regenerative repeater, a fault warning system comprising:

monitor means for monitoring a signal indicative of the condition of the optical digital signal regenerative repeater; and

fault warning means for transmitting a fault warning signal from the optical digital signal regenerative repeater, said fault warning means cooperating with said monitor means for transmitting the fault warning signal when the signal monitored by said monitor means indicates malfunctioning of the optical digital signal regenerative repeater, and said fault warning means transmitting a fault warning signal comprised of a unique digital optical pulse pattern selected from a plurality of individually distinguishable unique patterns obtained by establishing the start bits of a pseudo-noise sequence at time positions successively delayed with respect to each other and a fixed digital optical pulse pattern for indicating the time positions of the start bits of the unique pulse pattern, whereby identification of the unique digital optical pulse pattern of the fault warning signal enables identification of the optical repeater which transmitted the fault warning signal.

4,257,034

FEEDBACK-COMPENSATED RAMP-TYPE ANALOG TO DIGITAL CONVERTER

John R. Wilkinson, Dearborn, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,322

Int. Cl.[3] **H03K** *13/20, 13/02*

U.S. Cl. 340—347 NT **18 Claims**

1. A feedback-corrected ramp-type analog-to-digital converter comprising:

means for generating a charging current;

a ramp capacitor means responsive to said charging current for accumulating a charge thereon and generating a ramp voltage;

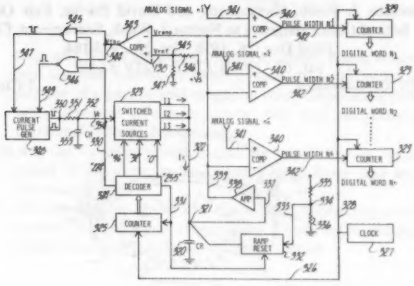
first comparator means responsive to said generated ramp voltage and an analog input signal for outputting a pulse-width comparator output as long as the value of said

analog input signal is greater than the value of said generated ramp voltage;

first counter means operatively coupled to the output of said first comparator means and responsive to said pulse-width comparator output signal for counting clock pulses at a predetermined rate during the time duration of said pulse-width output signal so as to accumulate a digital number indicative of the value of said converted analog input signal when said pulse-width comparator output signal ends;

second counter means for storing a zero count when said ramp capacitor means is discharged prior to the initiation of a particular conversion and for counting clock pulses during the generation of said ramp voltage;

decoding means operatively coupled to the outputs of said second counter means for pre-assigning a particular desired level of ramp voltage with a predetermined count number attained by said second counter means and for generating a "count detection" signal in response thereto;



voltage level comparator means for detecting when said generated ramp voltage reaches said particular desired level of ramp voltage assigned to said predetermined count number and generating a "voltage equal" signal in response thereto;

logic means for detecting the time difference between the time of generation of said "count detection" signal and said "voltage equal" signal as a measure of ramp rate error and for generating a signal indicative of ramp rate error in response thereto; and

means operatively coupled to said charging current-generating means and responsive to said signal indicative of ramp rate error for selectively increasing or decreasing the supplying of said charging current to said ramp-generating capacitor means to form a closed control loop for automatically correcting the rate of generation of said ramp voltage.

4,257,035

ALARM CIRCUIT FOR GENERATING SYLLABLE-PAUSE ALARM CODES

Anderson Yen, 4011 Cranford Cir., San Jose, Calif. 95124

Filed Nov. 1, 1979, Ser. No. 90,254

Int. Cl.[3] G08B 3/00

U.S. Cl. 340—384 E **24 Claims**

1. An alarm circuit for generating discrete syllable-pause codes representing various alarm conditions comprising:

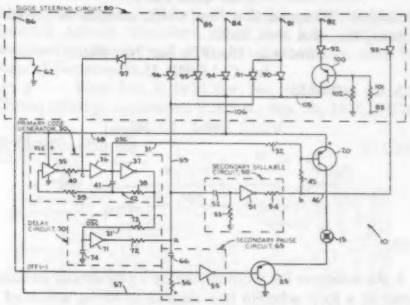
(a) an alarm;

(b) a first switching circuit connected to said alarm for controlling the operation thereof;

(c) a second switching circuit connected to said alarm for controlling the operation thereof;

(d) a primary code generator connected to said first switching circuit for applying a syllable-pause signal thereto to control the operation of said first switching circuit in accordance with the applied syllable-pause signal; and

(e) a steering circuit connected to said primary code generator to activate said primary code generator in response to the application of a voltage resulting from an alarm condi-



tion for applying the syllable-pause signal to said first switching circuit and connected to said second switching circuit for operating said second switching circuit in response to the application of the voltage resulting from the alarm condition to operate said alarm for generating a primary syllable-pause code.

4,257,036

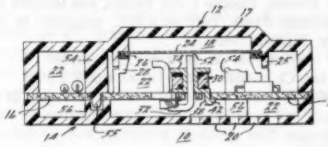
TONE GENERATOR

Michael Slavin, Troy, and Juhan Telmet, Fraser, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Continuation of Ser. No. 814,417, Jul. 11, 1977, abandoned. This application Nov. 27, 1979, Ser. No. 94,722

Int. Cl.[3] G08B 3/10

U.S. Cl. 340—388 **10 Claims**



1. A tone generator adapted for use with an automotive vehicle or the like and to generate a timed audible signal in conjunction with a visual signal by a lamp on the vehicle, said tone generator comprising a diaphragm; an electromagnetic coil for causing said diaphragm to vibrate by means of cyclic energization of said coil; an oscillator for cyclically energizing said electromagnetic coil; and a control circuit including timing means for controlling the enabling of said oscillator and the energization of said lamp; said timing means including a positive temperature coefficient resistance element comprising a body of PTC material having an anomaly temperature, said body having electrically conductive contact surface layers on first and second discrete surfaces thereof, said first conductive surface layer defining first, second and third discrete contact areas, said contact areas being electrically isolated from each other and forming a plurality of PTC resistor means with respect to said second conductive surface layer, said contact areas being apportioned and disposed so that said first and second contact areas are larger than said third contact area and said second contact area is disposed between said first and third contact areas, said first contact area being connected across an electrical source, said second contact area adapted to be connected between said electrical source and said lamp for controlling the energization of said lamp, and said third contact

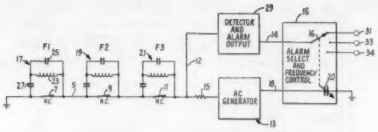
area being connected between said electrical source and said oscillator for controlling the enabling of said oscillator.

4,257,037

INDICATOR AND ALARM FOR BURGLAR ALARMS AND THE LIKE

Ronald W. Mongeon, San Jose, Calif., assignor to Stellar Systems, Inc., San Jose, Calif.

Filed Aug. 15, 1979, Ser. No. 66,622
Int. Cl.³ G08B *25/00*
U.S. Cl. 340—533 **9 Claims**



1. An indicator for a system having a plurality of switches in series in a loop wherein it is desired to know which of said switches is open comprising in combination:

a. a passive resonator across each of said switches, said resonator having a high impedance at its resonant frequency and a low impedance at all other frequencies,

b. each of said resonators being tuned to a different frequency,

c. an AC generator for generating a series of frequencies encompassing the resonant frequencies of said passive resonators,

d. detection means for detecting a high impedance in said loop, and

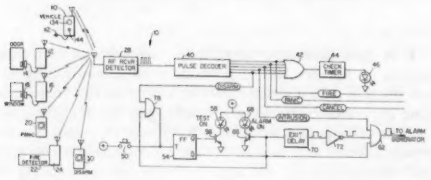
e. indicating means to indicate the frequency at which a high impedance is detected.

4,257,038

CODED SECURITY SYSTEM

Michael F. Rounds, Rancho Palos Verdes, and Richard D. Ranney, Hermosa Beach, both of Calif., assignors to Notifier Company, Lincoln, Nebr.

Filed Feb. 28, 1979, Ser. No. 16,094
Int. Cl.³ G08B *13/00, 19/00;* B60R *25/10*
U.S. Cl. 340—539 **21 Claims**



1. A coded security system comprising:

a plurality of remote sending means for transmitting coded signals indicative of predetermined conditions at remote locations of a protected area, some of the sending means including sensors for detecting intrusions into the protected area and other of the sending means providing signals indicative of priority emergency conditions;

a central alarm station;

decoding means for receiving and decoding each of the coded signals at the central alarm station and providing discrete decoded signals identifying the individual predetermined conditions indicated by the coded signals transmitted from the remote sending means;

indicating means connected to the decoding means and responsive to each of the discrete signals provided by the decoding means to indicate receipt of a coded signal by the decoding means;

alarm means at the alarm station for generating an alarm signal in response to the discrete decoded signals provided by the decoding means;

selectively operable testing means at the central alarm station connected to the decoding means for gating the discrete decoded signals identifying intrusions to the alarm means from the decoding means, thereby enabling or disabling the alarm means to respond to the intrusion signals; and

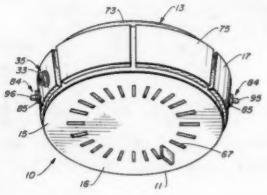
circuit means interposed between the decoding means and the alarm means for transmitting the decoded signals identifying priority emergency conditions to the alarm means independently of the testing means whereby the alarm means responds to the priority emergency conditions independently of the testing means and responds the intrusion conditions through the testing means.

4,257,039

SMOKE DETECTOR

Norman J. Webb, Sacramento, and David Bories, Fair Oaks, both of Calif., assignors to Norma J. Webb, Sacramento, Calif.

Filed Dec. 26, 1978, Ser. No. 973,184
Int. Cl.³ G08B *17/10;* F21V *33/00*
U.S. Cl. 340—629 **7 Claims**



1. In a smoke detector having a housing consisting of a base and a cover, and having a smoke sensing chamber, means to activate an alarm upon the sensing of a predetermined smoke level by the sensing chamber, and an alarm, all of which are mounted in the base of said housing;

said base having at least one downwardly side wall, and a bottom wall, the improvement comprising:

a pair of lamp sockets, each mounted generally normal to said side wall, and disposed 180° apart from each other on said side wall, each socket having an electric light bulb therein adapted to be lit when said sockets are energized, each of said sockets being electrically connected to;

a means to energize said sockets when the alarm sounds and deenergize said sockets when the alarm ceases;

whereby a path of egress from the vicinity of said smoke detector is lighted when the detector detects smoke and sounds the alarm.

4,257,040

ENGINE ROTATIONAL INFORMATION DETECTING APPARATUS

Shinji Shirasaki, Kariya; Katsuhiro Ohta, Funabashi, and Takao Sugisaki, Ichikawa, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and TDK Electronics Co., Ltd., Tokyo, both of, Japan

Filed Mar. 15, 1979, Ser. No. 20,926
Claims priority, application Japan, Apr. 28, 1978, 53-51786
Int. Cl.³ G01P *3/44;* H02K *24/00;* G08B *21/00*
U.S. Cl. 340—671 **10 Claims**

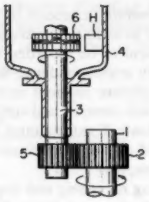
1. An apparatus for obtaining angular and reference information relating to a cyclically varying phenomenon, comprising:

a rotating member associated with said cyclically varying phenomenon, said rotating member including a circumferential periphery having a multiplicity of magnetic poles,

each of said magnetic poles being formed on the circumferential periphery over an axial length thereof, a slot being formed on said circumferential periphery by omitting a portion of some of said magnetic poles, the width of said slot being at least a width of a pair of magnetic poles;

an angle sensor disposed opposite said circumferential periphery for producing an output signal in response to magnetic fluxes produced by said magnetic poles;

a rotational reference sensor disposed opposite said circumferential periphery and axially displaced from said angle sensor, for producing an output signal in response to



magnetic fluxes produced by said magnetic poles, wherein said omitted portion of some of said magnetic poles is a portion of a part of said magnetic poles disposed opposite said rotational reference sensor, and said slot provides rotational reference information;

an angular signal generator circuit for generating an angular signal in response to an output signal from said angle sensor; and

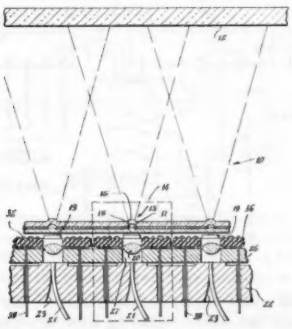
a reference signal generator circuit for producing a rotational reference signal from output signals from said angle sensor and said rotational reference sensor.

4,257,041

ELECTRO OPTICAL DISPLAY DEVICE

Carmine Masucci, Eastchester, N.Y., assignor to Izon Corporation, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,740
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—705 **13 Claims**



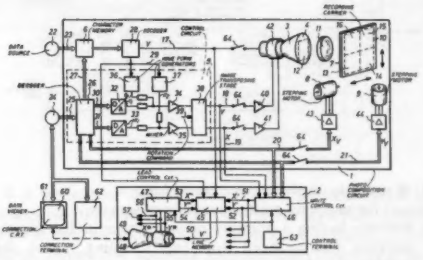
1. An electro optical display device of the type in which an electrical signal is translated into alphanumeric, graphic and pictorial images comprising an array of individual projection lenses, each of said lenses being responsive to light of a different segment of said image, an array of electronically addressed electro optical display elements each of which is aligned with and on the optical axis of a respective one of the lenses, each of said elements being matrix addressable for formation of said segment of an image thereon, and a screen onto which said segments of the images on the display elements are assembled by projection by the lenses, said lenses being spaced from one another such that said assembled projection is without visible division.

4,257,042

ELECTRONIC PATTERN GENERATOR

Eckhard Lindemann, Raisdorf; Jörg Bröning, Heikendorf, and Dietrich Asbach, Klausdorf, all of Fed. Rep. of Germany, assignors to Firma Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,398
Claims priority, application U.S.S.R., Sep. 30, 1977, 2527002
Int. Cl.² G06K *15/20*
U.S. Cl. 340—716 **17 Claims**



1. In an electronic pattern generator for line-by-line recording of characters from video-data recallable from memory by a command,

in combination,

control-circuit means controllable by said command for transforming the video-data recalled from memory into a first video signal,

first display means, including a first screen, an electron beam impinging on said first screen, and a first deflection circuitry to deflect said beam on said first screen, operable to receive said first video signal and for displaying said characters on said first screen, said control-circuit means generating first deflection signals for feeding said first deflection circuitry,

a recording medium mounted on a recording carrier,

means for transferring at least a portion of the display on said screen on said recording medium, said recording carrier being displaceable by a set of displacement signals with respect to said screen in first and second directions in a plane substantially parallel to the plane of said screen,

storage means connected to said control-circuit means for storing said first video signal and for transforming said first video signal into a second video signal;

second display means, including a second screen, an electron beam impinging on said second screen, and a second deflection circuitry to deflect said beam on said second screen, operable to receive said second video signal and for displaying characters being identical to the characters displayed on said first screen,

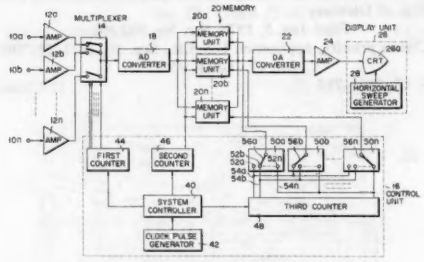
write generator means connected to said storage means generating write signals for storing said first video signal in said storage means, said write signals being produced by coupling the first deflection signals and said set of displacement signals, and

read generator means connected to said storage means generating read signals for transforming said first video signal into said second signal and for read out of said second video signal from said storage means, and for obtaining second deflection signals for feeding said second deflection circuitry in said second display means, whereby the display on said second screen may be processed independently of the display on said first screen.

4,257,043
MULTICHANNEL DISPLAY DEVICE

Masayoshi Tsuchiko, Zama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 22, 1978, Ser. No. 889,009
Claims priority, application Japan, Mar. 24, 1977, 52-32391
Int. Cl.[3] G09G *1/08*
U.S. Cl. 340—722 **6 Claims**

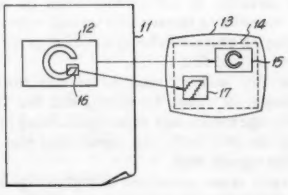


1. A multiple display device comprising:
means for sampling multichannel input signals;
a memory having a plurality of memory units for storing sampled data received from said sampling means, the number of said memory units being the same as that of the number of channels;
means for writing the sampled data into said memory units at common sampling time intervals;
data readout means for reading out sampled data from said memory units at readout time intervals identical with said common sampling time intervals;
display means for displaying the waveforms of said input signals;
a horizontal sweep signal generator for producing and supplying to said display means a horizontal sweep signal whose frequency is varied in accordance with each respective multichannel signal; and
channel switching means for simultaneously displaying said input signals means.

4,257,044
GRAPHIC DISPLAY SYSTEM FOR RASTER SCANNING INVOLVING WOBBLING

Kenji Fukuoka, Fussa, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 855,432, Nov. 28, 1977, abandoned.
This application Oct. 18, 1979, Ser. No. 86,069
Claims priority, application Japan, Nov. 29, 1976, 51-142144
Int. Cl.[3] G06F *3/14*
U.S. Cl. 340—731 **7 Claims**

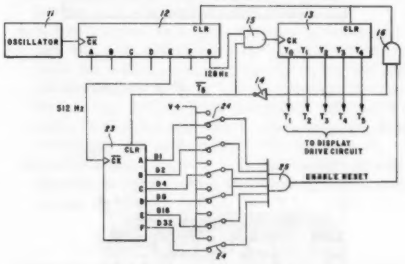


1. A graphic display system for raster scanning comprising means for extracting a given partial pattern from an original pattern and having means for comparing a counted value of an input coordinate X axis counter for counting the number of picture elements of the original pattern at every scanning line with given preset values so as to select a picture element having an X coordinate value within a given range of input coordinates and comparing a counted value of an input coordinate Y axis counter for counting the number of scanning lines of the original pattern with given preset values so as to select a picture element having an X coordinate value within the given range of the input coordinates;
means for presetting given values to a display coordinate X axis counter and to a display coordinate Y axis counter, respectively, so as to bring a leading picture element of said partial pattern extracted from said original pattern into correspondence with given coordinates of display coordinates;
means for incrementing contents of said display coordinate X axis counter so as to determine a coordinate position of a picture element to be recorded next to a recorded picture element in correspondence with recording and display of each picture element and resetting said display coordinate X axis counter and subjecting contents of said display coordinate Y axis counter to increment when the contents of said display coordinate X axis counter exceed said given value; and
means for stopping recording and display when the contents of both said display coordinate X axis counter and said display coordinate Y axis counter reach to respective given present values so as to control the recording of said partial pattern said picture element being comprised of a plurality of spots, the number of said spots being preset so that the size of a picture element is made variable and the magnification of the display may be varied, selected portions of the input picture image being removable and the resultant picture image being displayable on a selected portion of the display surface.

4,257,045
RMS VOLTAGE CONTROL WITH VARIABLE DUTY CYCLE FOR MATCHING DIFFERENT LIQUID CRYSTAL DISPLAY MATERIALS

Larry L. Miles, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 5, 1978, Ser. No. 948,933
Int. Cl.[3] G06F *3/14*; G09F *9/32*
U.S. Cl. 340—784 **18 Claims**



1. A liquid crystal display system, responsive to a plurality of segment logic signals for displaying information on a display thereof, said segment logic signals representing the on/off states of each of a plurality of activatable segments in said display, said display system comprising:
(a) display drive means for applying drive voltage to the display, said drive means for applying a first set of voltage signals to a plurality of backplanes in said display and a second set of voltage signals to the plurality of segments in said display, said drive means being responsive to said segment logic signals for applying said second set of voltage signals; and
(b) counting means for counting a predetermined number of first time intervals in succession and a second time interval

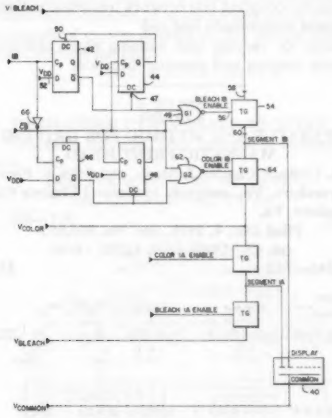
after said first time intervals during each cycle of said drive voltage, said second time interval being selected according to the liquid crystal material and generating one of a plurality of enabling signals during each of said first time intervals and a disabling signal during said second time interval, each enabling signal triggering said drive means to apply a selected one of said first set of voltage signals to each backplane and a selected one of said second set of voltage signals to said segments in accordance with said segment logic signals, said disabling signal triggering said drive means to apply the same voltage to each backplane and segment, thereby disabling the drive voltage across each segment during said second time interval to adjust the root mean square drive voltage to match said liquid crystal material.

4,257,046

SIMULTANEOUS COLOR AND BLEACH OF ECD

Horst Witzke, Princeton, and James W. Pollock, New Egypt, both of N.J., assignors to Refac Electronics Corporation, Barkhamsted, Conn.

Filed Dec. 20, 1978, Ser. No. 971,414
Int. Cl.[3] G09F 9/00
U.S. Cl. 340—785 **11 Claims**



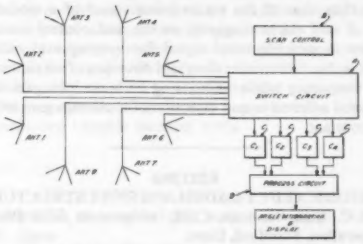
1. In an electrochromic display device having an indicator with an arrangement of a plurality of electrochromic display segments with common electrode means and a plurality of display segment electrodes respectively, adapted to be selectively driven to bleach and color display states with applied bleach and color drive signals respectively of opposite polarity relative to the common electrode means, and an indicator operating circuit having input means for receiving successive applied display select signals for selecting successive bleach and color display segment arrangements, and segment operating circuit means for selectively applying said bleach and color drive signals to the display segment electrodes in accordance with the selected arrangement of each display select signal applied to the input means, the improvement wherein the segment operating circuit means comprises redundancy control circuit means operable for preventing application of consecutive color drive signals to any segment electrode in accordance with consecutive display select signals.

4,257,047

METHOD AND APPARATUS FOR ELECTRICALLY SCANNING AN ANTENNA ARRAY IN A MONOPULSE DF RADAR SYSTEM

Stephen E. Lipsky, Kings Point, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed May 3, 1979, Ser. No. 35,599
Int. Cl.[3] G01S 5/04, 5/02, 13/00
U.S. Cl. 343—120 **34 Claims**



1. A method for obtaining direction finding information in a monopulse DF radar system of the type having a multi-channel receiver, and an antenna array including a plurality of fixed narrow beamwidth antennas geographically oriented to provide omnidirectional coverage, the method comprising the steps of:

A. selecting a set of antennas, said selected set comprising first and second oppositely oriented pairs of adjacent antennas;

B. operatively connecting each of the antennas in said selected set to a different one of the receiver channels, respectively;

C. simultaneously generating first and second monopulse ratios from the respective signals received on the first and second pairs of adjacent antennas in the selected set;

D. selecting the ratio which represents the forelobe response of the antennas in the selected set; and

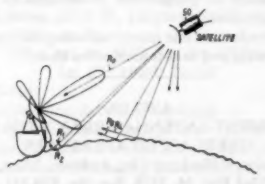
E. processing the selected ratio to obtain the angle of arrival information.

4,257,048

ANTENNA SYSTEM TO REDUCE FADING CAUSED BY MULTIPATH TRANSMISSION

Hiroshi Yokoi, Machida, and Takayasu Shiokawa, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 614,959, Sep. 19, 1975, abandoned. This application Feb. 28, 1978, Ser. No. 882,247
Claims priority, application Japan, Sep. 28, 1974, 49/11822
Int. Cl.[3] H01Q 1/34, 3/28
U.S. Cl. 343—709 **13 Claims**



1. An antenna system, which reduces the effect of amplitude variations caused by multipath fading superimposed on electromagnetic waves transmitted over a maritime communication path and received by the antenna system, comprising: a directional antenna including a plurality of antenna elements

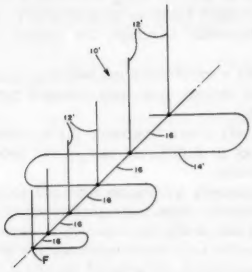
and having a radiation pattern including a main lobe defining a direction of maximum gain for receiving electromagnetic waves in the direction of maximum gain and a side lobe gain pattern oriented in directions other than the direction of maximum gain; means for mechanically adjustably directing the direction of the maximum gain of said directional antenna to a desired direction for receiving said electromagnetic waves; means for independently generating an electrical signal having a frequency higher than that of the amplitude variations superimposed on the received electromagnetic waves and also higher than that of the transmission speed of a modulation signal of said electromagnetic waves; and control means responsive to said electrical signal for varying said radiation pattern in directions other than said direction of maximum gain at said frequency while maintaining the main lobe gain of said directional antenna in said direction of maximum gain substantially constant.

4,257,049

PERIODICALLY LOADED ANTENNA STRUCTURE

Samuel C. Kuo, Saratoga, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 15, 1979, Ser. No. 84,843
Int. Cl.³ H01Q *11/10*
U.S. Cl. 343—792.5 **3 Claims**



1. A log-periodic monopole antenna adapted for use over a ground plane comprising

a plurality of longitudinally spaced linear parallel radiating elements disposed in a vertical plane and each comprising a single solid rod-like conductor, said elements having dimensions and interelement spacings which increase in one longitudinal direction in progressive increments of a predetermined ratio,

a meander transmission line disposed in a plane perpendicular to said vertical plane and connected successively to said elements proximate to said ground plane,

the lengths of said line between adjacent elements being substantially greater than corresponding interelement longitudinal spacings, said line lengths increasing in said one direction in progressive increments of a predetermined ratio, and

a straight conductive line interconnecting the connections of said elements and said transmission line.

4,257,050

LARGE ELEMENT ANTENNA ARRAY WITH GROUPED OVERLAPPED APERTURES

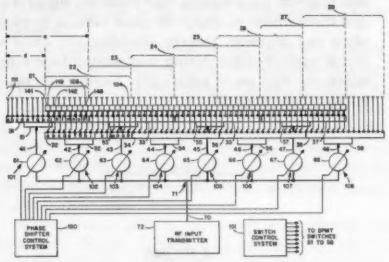
George Ploussios, 4 Hackney Cir., Andover, Mass. 01810

Filed Feb. 16, 1978, Ser. No. 878,331
Int. Cl.³ H01Q *3/26*
U.S. Cl. 343—854 **11 Claims**

1. In radio frequency (RF) antenna system having a linear array of η antenna apertures for which the net radiation pattern has a pointing direction and means for coupling said antenna apertures to a common transmission line that conducts high frequency energy to or from the apertures, the improvement comprising,

(a) N aperture distribution networks each having a plurality of outputs of which successive outputs are coupled to the antenna apertures in serial order and at least one input a plurality of inputs coupled to the common transmission line,

(b) the η apertures being designated as included in N different sets of apertures where $N < \eta$



(c) the outputs of each network being electrically coupled to a different one of said sets of said apertures, some of said network outputs having an aperture in common,

(d) a separate network transmission line for each network, coupled to the network input

(e) variable phase shifting means in each network transmission line,

(f) means for coupling said network transmission lines to said common transmission line and

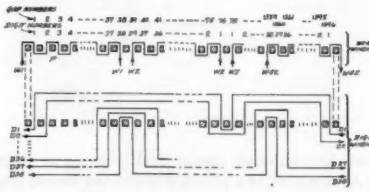
(g) means for varying said variable phase shifting means thereby varying said pointing direction.

4,257,051

APPARATUS AND METHOD FOR DRIVING A MAGNETIC PRINT HEAD

Donald S. Lindsay; Charles J. Menk, and John A. Popelish, all of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Dec. 4, 1978, Ser. No. 965,853
Int. Cl.³ G06F *3/14*; G03G *19/00*
U.S. Cl. 346—74.5 **43 Claims**



1. An electronic circuit for driving at least first and second sets of coincident current windings on a magnetic print head in accordance with supplied printing data signals, said circuit comprising:

first drive means connected to successively energize different ones of said first set of windings, and

second drive means for selectively energizing said second set of windings,

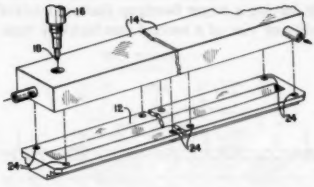
means for minimizing undesirable concentrations of magnetic flux during printing comprising means for controlling said second drive means to successively energize different predetermined sub-sets of said second set of windings, in accordance with said supplied data signals, while each of the first set of windings is energized by said first drive means.

4,257,052

MOLDED ORIFICE PLATE ASSEMBLY FOR AN INK JET RECORDER AND METHOD OF MANUFACTURE

Leonard G. Stoneburner, Fairborn, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 29, 1979, Ser. No. 88,979
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **5 Claims**



1. An orifice plate assembly for use in an ink jet printing device comprising,

an orifice plate holder having generally vertical side and end walls, and

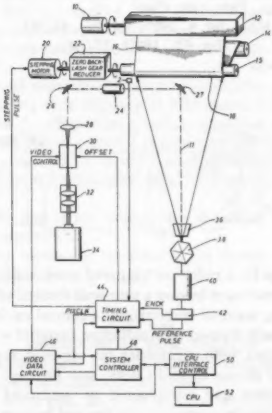
a thin, elongated orifice plate having at least one row of orifices therein, said orifice plate having a generally flat bottom portion and sidewalls extending outwardly therefrom at an acute angle from the horizontal, said sidewalls of said orifice plate being embedded in said sidewalls of said orifice plate holder forming an integral assembly therewith and defining a liquid supply reservoir, said orifice plate holder being of a relative mass substantially to prevent the formation of spurious vibrations and confine the acoustical energy applied to said orifice plate to the bottom portion thereof.

4,257,053

HIGH-RESOLUTION LASER PLOTTER

Cecil R. Gilbreath, Houston, Tex., assignor to Geosource, Inc., Houston, Tex.

Filed Feb. 9, 1979, Ser. No. 10,797
Int. Cl.[3] G01D *9/42, 15/10*
U.S. Cl. 346—108 **37 Claims**



1. A high-resolution graphics plotter for plotting data on a recording medium as selectively positioned spots of variable intensity, the plotter comprising:

(a) a collimated light source, for providing a beam of light, the light beam having a diameter;

(b) a light intensity modulator responsive to the data, for modulating the intensity of the light beam;

(c) a light-sensitive film positionable in a flat field image plane for exposure by the modulated light beam;

(d) a rotatable multi-facet mirror, for scanning along a line the modulated light beam across the image plane of said film, said mirror having facet-to-facet and facet-to-axis errors, each facet of said mirror rotated into a start plot position relative to said film, at which position plotting of the scan line begins;

(e) a light beam control means positioned between said mirror and the image plane, for providing compensation for the non-linear velocity of the modulated light beam as it is scanned across the image plane; and

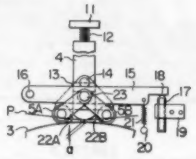
(f) a spot positioning means responsive to the rotation of said mirror, for compensating for the facet-to-facet and facet-to-axis errors, and for generating a spot placement signal which cooperates with the data to produce the selectively positioned variable intensity spots.

4,257,054

RECORDING APPARATUS

Chuji Ishikawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jul. 30, 1979, Ser. No. 62,134
Claims priority, application Japan, Aug. 2, 1978, 53-94200
Int. Cl.[3] G01D *15/06, 15/16*
U.S. Cl. 346—155 **16 Claims**



1. In a recording apparatus of the type wherein a recording electrode and a drum which are disposed in close proximity with each other with a predetermined close clearance therebetween and which are capable of forming a visible image or a latent electrostatic image on a recording sheet which passes through the clearance by applying signals corresponding to image information to be recorded on the recording sheet to said recording electrode, the improvement comprising a pair of support members swingably mounted on each of the opposite ends of said recording electrode and at least two roller members operatively engaging each of said support members in pressure contact with the peripheral surface of said drum under the weight of said recording electrode thereby retaining said clearance between said recording electrode and said drum.

4,257,055

NEGATIVE RESISTANCE HETEROJUNCTION DEVICES

Karl Hess, Urbana; Ben G. Streetman, Champaign, and Hadis Morkoc, Urbana, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Jul. 26, 1979, Ser. No. 60,893
Int. Cl.[3] H01L *29/161*
U.S. Cl. 357—16 **10 Claims**

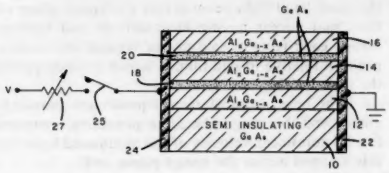
1. A heterojunction device comprising:

first and second semiconducting layers exhibiting predetermined energy gaps between their conduction and valence bands, said layers exhibiting low mobility and being doped to have charge carriers;

a third high mobility semiconducting layer sandwiched between said first and second layers, and having a lesser energy band gap than said first and second layers, whereby, in a quiescent state, charge carriers from said first and second layers reside in said third layer; and

energization means for applying to said third layer an elec-

tric field of a strength which imparts sufficient energy to said charge carriers in said third layer to cause their move-



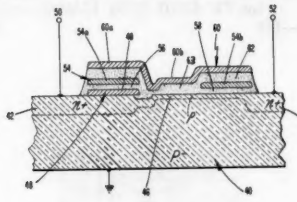
ment into said first and second layers, the axis of said electric field being substantially parallel to the interface between said layers.

4,257,056

ELECTRICALLY ERASABLE READ ONLY MEMORY

Ying K. Shum, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 27, 1979, Ser. No. 52,595
Int. Cl.³ H01L *29/78, 29/34, 29/04;* **G11C** *11/34*
U.S. Cl. 357—23 **13 Claims**



1. A floating gate storage cell comprising:

(a) a body of semiconductor material having a substrate of a first conductivity type, a source region and a drain region each of a second conductivity type and a channel region of the first conductivity type connecting the source region and the drain region,

(b) a polycrystalline silicon layer conductively connected to either the source region or the drain region,

(c) a conductive floating gate insulated from the source region, drain region, channel region, and from the polycrystalline silicon layer, the floating gate having a first portion overlying the channel region to influence the conductivity of the channel region in accordance with charge stored thereon and a second portion overlying and insulated from the polycrystalline silicon layer to allow Fowler-Nordheim tunneling current between the polycrystalline silicon layer and the floating gate,

(d) and a control gate insulated from the floating gate, the source region, drain region and the channel region, the control gate having a first portion overlying the first portion of the floating gate to influence the conductivity of the channel in response to any potential applied to the control gate.

4,257,057

SELF-MULTIPLEXED MONOLITHIC INTRINSIC INFRARED DETECTOR

Derek T. Cheung; A. Mike Andrews, II, and Joseph T. Longo, all of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 7, 1979, Ser. No. 36,885
Int. Cl.³ H01L *29/78, 29/205, 27/14, 31/00*
U.S. Cl. 357—24 **2 Claims**

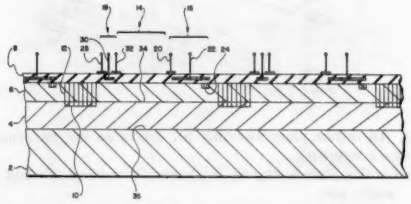
1. A self-multiplexed detector array comprising:

a first conductivity type, intrinsic semiconductive substrate of $Ga_{(1-x)}In_xSb$ which is transparent to radiation,

a first conductivity type, intrinsic semiconductive active layer of $InAs_{(1-y)}Sb_y$ deposited on said substrate to form a heterojunction between said substrate and said active layer;

a first conductivity type, intrinsic semiconductive signal processing layer of $Ga_{(1-z)}In_zSb$ epitaxially deposited on said active layer to form a heterojunction between said active layer and said signal processing layer, said signal processing layer having signal processing circuitry fabricated thereon, said signal processing layer and said substrate having a larger bandgap than said active layer;

a plurality of vias of a second conductivity type extending



through said signal processing layer into said active layer and forming a plurality of p-n homojunctions in said active layer between said first conductivity type active layer and said second conductivity type vias, said p-n homojunctions forming the detector array;

an insulating layer of SiO_2 on said signal processing layer; and

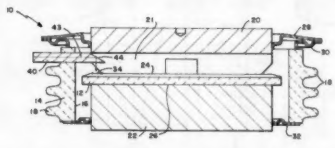
an input gate on said insulating layer adjacent each via for controlling the input charge from each via into said signal processing circuitry, whereby radiation entering said substrate is converted into electrical signals and processed on a single monolith.

4,257,058

PACKAGE FOR RADIATION TRIGGERED SEMICONDUCTOR DEVICE AND METHOD

Armand P. Ferro, Schenectady, and Victor A. K. Temple, Clifton Park, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 5, 1979, Ser. No. 54,787
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **13 Claims**



1. A package for a radiation triggered semiconductor device including an enclosure having a side wall formed of an electrically insulating material surrounding a central cavity, and top and bottom walls formed of conductive material which make electrical contact with electrodes on opposed surfaces of a semiconductor device in said cavity, said package being hermetically sealable and constructed to withstand externally applied compression exerted on the top and bottom walls, said package further comprising: optical conduit means extending through and hermetically sealed to the insulating side wall of said enclosure and transmitting radiation in said package along a first optical path, said optical conduit means terminating in a reflective surface such surface redirecting radiation from said first optical path toward a predetermined region in said cavity whereby the radiation is directed to a specific portion of a

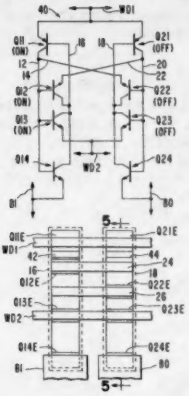
radiation triggered semiconductor device in said cavity to trigger the device.

4,257,059

INVERSE TRANSISTOR COUPLED MEMORY CELL

William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Dec. 20, 1978, Ser. No. 971,623
Int. Cl.³ H01L *27/04;* H03K *19/082*
U.S. Cl. 357—46 **2 Claims**



1. A semiconductor memory cell comprising:

a unitary body of semiconductive material of a first conductivity type:

a first semiconductive region of a second conductivity type disposed in P-N junction forming relation with the semiconductive body;

a second semiconductive region of a second conductivity type separate from the first semiconductive region and disposed in P-N junction forming relation with the semiconductive body;

third and fourth epitaxial layers of semiconductive material of the first conductive type disposed in P-N junction forming relation with the first and second regions respectively on the surface thereof remote from the semiconductor body;

fifth and sixth separate semiconductive regions of the second conductivity type disposed in P-N junction forming relation with the third layer of semiconductive material;

seventh and eighth separate semiconductive regions of the second conductivity type disposed in P-N junction forming relation with the fourth layer of semiconductive material;

conducting means for connecting the third layer to the eighth region; and

conducting means for connecting the fourth layer to the sixth region.

4,257,060

SEMICONDUCTOR SWITCH

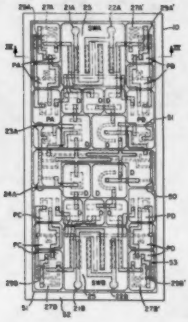
Shigeru Kawamata, and Kiyoshi Tsukuda, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 26, 1978, Ser. No. 972,872
Claims priority, application Japan, Dec. 23, 1977, 52-154509
Int. Cl.³ H01L *27/04;* H03K *17/735*
U.S. Cl. 357—49 **12 Claims**

1. A semiconductor cross-point switch having a plurality of islands of silicon monocrystal disposed in a supporting body of silicon polycrystal through a dielectric film, comprising:

a set of switching circuit islands, each comprising switching circuits comprised of one or more thyristors for alternately turning on and off to respectively pass or block current flow through the thyristors in accordance with control signals applied to control gates of the thyristors;

a set of driving circuit islands providing a driving circuit comprising means for igniting said thyristors of said switching circuits by providing the control signals to the control gates of the thyristors; and



two sets of protective islands providing protective circuits comprising means for preventing erroneous ignition of the thyristors of said switching circuit,

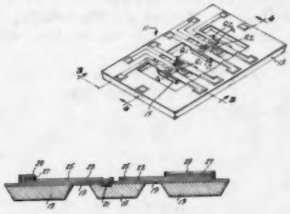
wherein the set of driving islands the sets of protective circuit islands are disposed adjacently to the respective set of switching circuit islands, so that the switching circuit islands are isolated from one another by the protective circuit islands.

4,257,061

THERMALLY ISOLATED MONOLITHIC SEMICONDUCTOR DIE

Roy W. Chapel, Jr., Edmonds, and I. Macit Gurol, Seattle, both of Wash., assignors to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Oct. 17, 1977, Ser. No. 842,972
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—69 **98 Claims**



1. A thermally isolated monolithic semiconductor die comprising:

(a) semiconductor wafer including:

(1) a frame having an aperture formed therein; and,

(2) at least one island located in said aperture in said frame, said island having formed therein a semiconductor item having a plurality of terminals; and,

(b) a plurality of support leads, each of said support leads extending between said island and said frame and formed such that the island end of said support leads are each in contact with a predetermined one of the terminals of said semiconductor item, said support leads providing the sole support for said island, each of said support leads including a layer of a structurally strong metal of high electrical

conductivity and low thermal conductivity, said layer of structurally strong metal being substantially thicker than any other layer of said support leads.

4,257,062

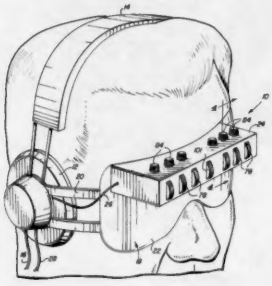
PERSONALIZED AUDIO-VISUAL SYSTEM

Russell W. Meredith, 1126 East 7th Place, Mesa, Ariz. 85203

Filed Dec. 29, 1978, Ser. No. 974,307

Int. Cl.[3] H04N *9/02*

U.S. Cl. 358—81 **26 Claims**



1. An audio-visual system for personalized use by an individual, comprising audio means for receiving an audio input signal, and for transforming said signal to an audio output audible to the individual; and a visor assembly for reception in close-coupled relation with the individual's face for substantially completely covering the individual's vision, said visor assembly including a visual display panel visible to the individual, means for receiving the audio signal and for transforming the same to a visual output of varying color and intensity patterns correlated with said audio output, and means for transmitting said visual output for display on said visual display panel, said visual display panel being located in sufficiently close coupled relationship to the individual's eyes to substantially prevent focusing of the eyes on said visual output.

4,257,063

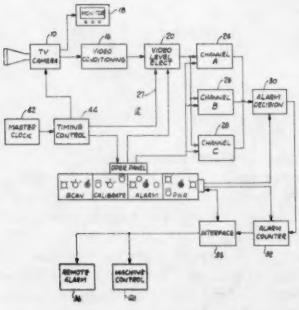
VIDEO MONITORING SYSTEM AND METHOD

H. Hampton Loughry, Hudson, and Abraham Zeewy, University Heights, both of Ohio, assignors to Ham Industries, Inc., Macedonia, Ohio

Filed Mar. 23, 1979, Ser. No. 23,032

Int. Cl.[3] H04N *7/18*

U.S. Cl. 358—108 **23 Claims**



1. A system for sensing changes in distribution of energy emanating from a scene, said system comprising:

(a) pickup means for converting the energy to electrical signals representing intensity distribution of said emanation from the scene;

(b) circuitry cooperative with the pickup means for sampling energy intensity of each of a predetermined set of locations of the scene;

(c) circuitry for accumulating during a sampling period a count of the number of said sampled locations which emanate energy within a predetermined intensity range, said count being produced independently of the relative spatial positions within the scene of the sampled locations, and

(d) comparison circuitry for detecting at least a predetermined difference between the value of said count and a predetermined value.

4,257,064

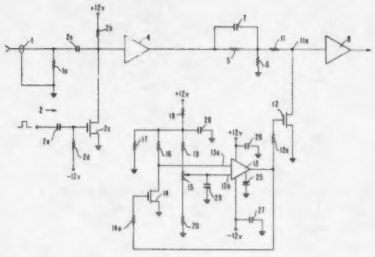
WIDEBAND LINEAR VIDEO CONTRAST CONTROL

Joseph H. Colles, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 19, 1980, Ser. No. 122,637

Int. Cl.[3] H04N *5/20*

U.S. Cl. 358—169 **7 Claims**



2. In a video system receiving an input signal from a transmission line having a signal conductor and a return conductor, a highly linear contrast control providing a constant termination impedance to said transmission line, comprising:

a termination resistor connected between said signal conductor and said return conductor;

an output node;

a series resistance connected between said signal conductor of said transmission line and said output node;

a first transistor having its source and drain connected between said output node and said return conductor;

a second transistor;

a potentiometer having an arm;

means for applying operating potentials across the source and drain of said second transistor and across said potentiometer; and

a differential amplifier including a positive input, a negative input and an output, one of said inputs connected to said potentiometer arm, the other of said inputs connected to receive the source-to-drain voltage of said second transistor and the output of said differential amplifier applied to the gates of said first and second transistors.

4,257,065

VIDEO CLAMP AND INVERTER CIRCUIT

Joseph M. Papay, Kitchener, Canada, assignor to Pay Television Corporation, Manhasset, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,558

Int. Cl.[3] H04N *1/44*

U.S. Cl. 358—172 **19 Claims**

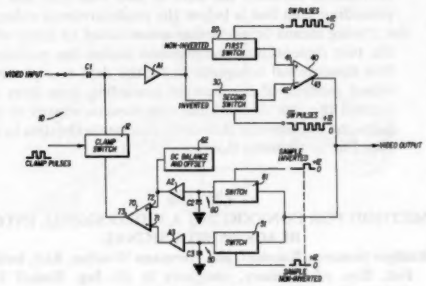
1. A video clamp and inverter circuit comprising:

(A) an input stage for receiving a composite television input signal, said input stage including a keyed clamp;

(B) a video amplifier for selectively providing an inverted

ouput signal and a non-inverted output signal at a common video output, said video amplifier including inverting and non-inverting input terminals;

(C) a first switch, selectively operable, to connect the output of said input stage to the non-inverting input terminal of said video amplifier;



(D) a second switch, selectively operable, to connect the output of said input stage to the inverting input terminal of said video amplifier; and

(E) a feedback circuit, coupling the output of said video amplifier to said input stage, said feedback circuit being selectively operable to establish predetermined DC reference levels for said inverted and non-inverted output signals.

4,257,066

CHANNEL SELECTING APPARATUS FOR USE WITH SIGNAL RECEIVER AND SIGNAL RECORDER

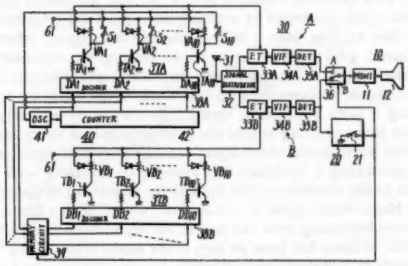
Yoshiro Kaneko, Hoya, and Masaru Sato, Asaka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,857

Claims priority, application Japan, May 17, 1978, 53-64941[U]

Int. Cl.³ H04N *5/22*

U.S. Cl. 358—183 **8 Claims**



1. A video apparatus comprising first and second tuning means for tuning first and second video signals, respectively, said first and second video signals each conveying visual information and synchronizing information including horizontal sync pulses, and said video signals each including a plurality of video fields each of which includes a plurality of horizontal line intervals each having a picture portion in which said visual information is conveyed; display means having a display screen and deriving visual information and synchronizing information, including said horizontal sync pulses, from at least one of said first and second video signals for displaying visual information on said screen; switch means having a control input receiving a control signal for selectively applying one of said first and second video signals to said display means in response to first and second states, respectively, of said control input and for selectively controlling, in response to said states of said control inputs, from which of said first and second video signals said display means derives its visual and synchronizing information, including its horizontal sync pulses; and means for generating said control signal including split image generating means having means for generating said first state of said control signal during the displaying of visual information on a first area of said screen so that said first video signal is applied to said first area, and means for generating said second state of said control signal during the displaying of visual information on a second area of said screen and during the horizontal sync pulses of said second video signal so that said second video signal is applied to said second area and, during the displaying of visual information on said first and second areas, the synchronizing information of said display means is derived from said second video signal.

4,257,067

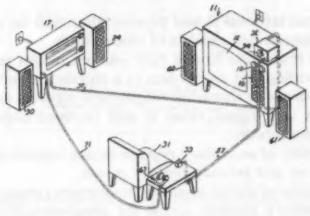
SOUND ENHANCEMENT SYSTEM FOR TELEVISION RECEIVERS

James S. Christopher, P.O. Box 102, San Bernardino, Calif. 92402

Filed Jul. 27, 1979, Ser. No. 61,523

Int. Cl.³ H04N *5/44, 5/60*

U.S. Cl. 358—189 **8 Claims**



1. A sound enhancement system for a television receiver having an audio channel including a speaker and an adjustable volume control device for said speaker comprising:

sound reproducing means having a second audio channel including a second speaker located remotely from said first mentioned speaker;

a second adjustable volume control device for said second speaker,

a circuit for connecting the input of said first mentioned speaker to the input of said second volume control device, an impedance device, and

switching means for selectively connecting said impedance device in and out of said circuit.

4,257,068

SYSTEM FOR PERIODICALLY REVERSING THE ORDER OF VIDEO DATA IN A FLAT PANEL DISPLAY DEVICE

Loren B. Johnston, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1979, Ser. No. 98,697

Int. Cl.³ H04N *3/00, 5/68*

U.S. Cl. 358—242 **11 Claims**

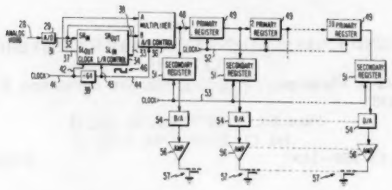
10. In a modular flat panel display device having a plurality of vanes dividing said display device into a plurality of channels, both sides of said vanes supporting deflection plates for transversely scanning adjacent channels in opposite first and second directions to produce a line of a visual display on said display device in response to video data, a system for reversing portions of said video data so that adjacent channels receive said data in received and reversed directions corresponding to said first and second directions comprising;

analog-to-digital converter means for receiving said video data in analog form and converting said video data into digital video data;

reversing shift register means for receiving said digital video data, said reversing shift register means having a right and a left input terminal and a right and a left output terminal;

means for providing clock pulses to said reversing shift register means;

means for providing left/right control signals to said reversing shift register means so that said reversing shift register means alternately receives said digital video data over said right and left input terminals for a predetermined number of clock pulses and unloads a portion said digital video data over said right output terminal in said received direction and a portion of said digital video data over said left



output terminal in said reversed direction for each of said predetermined number of clock pulses;

means responsive to said right and left output terminals for providing said digital data to a plurality of primary register means so that adjacent primary registers are provided with said digital video in said received order and said reversed order;

a plurality of secondary register means individually responsive to said primary register means;

a plurality of digital-to-analog converters responsive to said secondary register means for simultaneously providing analog data to each of said channels so that channels scanned in said first direction received said video data in said received order and channels scanned in said second direction receive said video data in said reversed order.

4,257,069

DATA COMPRESSION APPARATUS

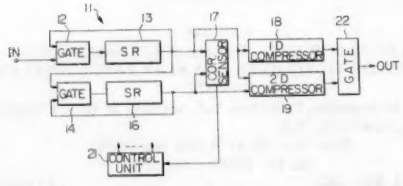
Noboru Murayama, and Hayashi Taniguchi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,906

Claims priority, application Japan, Jun. 29, 1977, 52-77625

Int. Cl.³ H04N *1/00*

U.S. Cl. 358—261 **20 Claims**



1. A data compression apparatus for compressing data representing a plurality of scan lines, comprising:

one dimensional compression means;

two dimensional compression means;

sensing means for sensing a degree of correlation between data in a scan line and a preceding scan line; and

control means responsive to the sensing means for controlling the two dimensional compression means to perform two dimensional data compression on the data in said scan line when the degree of correlation between the data in said scan line and said preceding scan line is above a predetermined value and for controlling the one dimensional scan means to perform one dimensional data compression on the data in said scan line when the degree of correlation between the data in said scan line and said preceding scan line is below the predetermined value;

the sensing means being further constructed to sense when the two dimensional compression means has performed two dimensional compression on the data in a predetermined number of consecutive preceding scan lines and control the one dimensional compression means to perform one dimensional data compression on the data in said scan line in response thereto.

4,257,070

METHOD FOR CONVERTING A VIDEO SIGNAL INTO A BLACK/WHITE SIGNAL

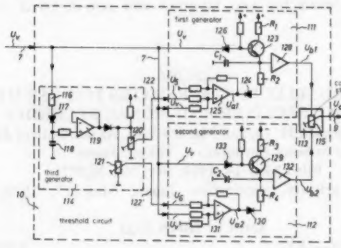
Rudiger Sommer, Raisdorf, and Hermann Wischer, Kiel, both of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Firma, Kiel, Fed. Rep. of Germany

Filed Apr. 3, 1979, Ser. No. 26,726

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1978, 2814891

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—282 **25 Claims**



1. In a facsimile reproduction, a method for converting a video signal, generated by scanning an original copy dot by dot and line by line, into a bilevel black/white signal, wherein coloured, grey or black areas on an original are recorded as "white" edged with black boundary lines, and wherein said video signal is converted into said black/white signal by comparing it with a threshold signal following it dynamically, a signal step occurring in said black/white signal at every intersection point of said video signal and said threshold signal, and for generating a boundary line running transversely with respect to the direction of the lines at the beginning of the area, said black/white signal is switched to "white" after a first time interval beginning with the step in the signal from "white" to "black" if there has been no step in the signal from "black" to "white" in said first time interval.

4,257,071

APPARATUS FOR DIGITIZING OPTICAL IMAGES

Reginald T. Lamb, 601 Leahy, Apt. 206, Redwood City, Calif. 94061

Filed Jul. 9, 1979, Ser. No. 56,059

Int. Cl.³ H04N *1/12, 1/18*

U.S. Cl. 358—286 **10 Claims**

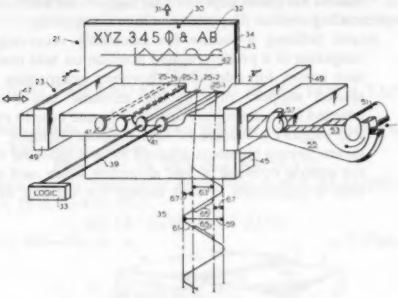
1. An image scanning apparatus of the kind in which optical elements scan an optical image to indicate the optical densities of pixels of the optical image, said apparatus comprising,

scanning means including an array of optical elements in one or more rows,

head means for holding the optical elements in a fixed spatial relationship to each other,

means for moving the head means with respect to an optical image to scan a raster pattern on the image, and

drive means for moving the optical image relative to the array of optical elements to scan successive rasters of the image and wherein the array of optical elements comprises a linear array and wherein the center of each optical



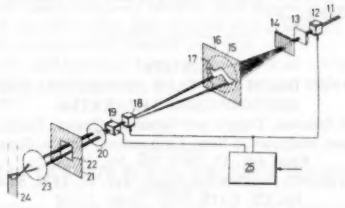
element is evenly spaced from an immediately adjacent optical element by at least one element diameter, and wherein the head means are moved at least through the distance between adjacent optical elements so that the optical elements scan all, or any part, or a full raster line of pixels across an optical image.

4,257,072

METHOD AND APPARATUS USING MULTIPLE DEFLECTIONS FOR REPRODUCING A HALFTONE IMAGE BY SCANNING

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Continuation-in-part of Ser. No. 695,780, Jun. 14, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 843,046
Claims priority, application Japan, Jun. 18, 1975, 50-73082
Int. Cl.³ H04N *1/22*
U.S. Cl. 358—298 **22 Claims**



1. Apparatus for reproducing a halftone image by scanning, wherein a scanning beam to be projected upon a photosensitive material is suitably controlled by means of image signals obtained from the scanning of an original, said apparatus comprising:

generating means means for generating image signals by scanning said original along a predetermined scanning direction,

a light source for emitting a beam for exposure,

first deflection means adapted for deflecting said beam in the scanning direction of the photosensitive material,

second deflection means disposed downstream along the light beam of said first deflection means and adapted for deflecting the beam in a direction parallel to the scanning direction,

an aperture plate disposed between said first and second deflection means and adapted for intercepting at least a portion of the width of the beam,

third deflection means adapted for deflecting the beam which has passed through the second deflection means in a direction orthogonal to the scanning direction,

an optical system for focusing the beam from said third deflection means onto the photosensitive material, and

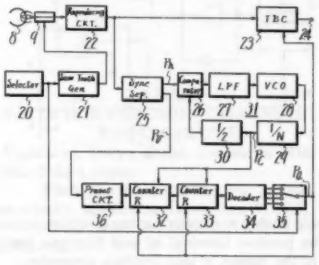
control means for controlling deflection angles at said first, second and third deflection means in response to the intensity of said image signals.

4,257,073

QUASI-VERTICAL SYNCHRONIZING SIGNAL GENERATOR

Mitsushige Tatami, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 5, 1979, Ser. No. 27,406
Claims priority, application Japan, Apr. 6, 1978, 53-40726
Int. Cl.³ H04N *5/78*
U.S. Cl. 360—10 **13 Claims**



1. Apparatus for use with a helical scan video tape reproducer (VTR) of the type having a magnetic head for scanning slant tracks, to generate a quasi-vertical synchronizing signal during the production of special video effects, such as stop motion, fast motion and reverse motion wherein the effective length of the scanning trace of said magnetic head differs from the length of the track being scanned thereby, such that said quasi-vertical synchronizing signal is produced when said magnetic head is at a predetermined location relative to the beginning of the scanning trace thereof as said head scans said track, said apparatus comprising means for controlling the tracking position of said head; means for sensing when said head reaches a pre-established location in the track being scanned thereby; means for selecting a particular track to be scanned next; and means for generating a delayed signal delayed from the time that said head reached said pre-established location, the delayed time being selectable as a function of the selected particular track to be scanned next and said delayed signal constituting said quasi-vertical synchronizing signal and being produced when said magnetic head is at the same predetermined location relative to the beginning of the next-following scanning trace thereof regardless of the effective length of said scanning trace.

4,257,074

TIME OPTIMAL FUNCTION GENERATOR FOR DISK FILE MAGNETIC RECORDING HEAD SERVO POSITION CONTROL LOOP

Lloyd C. Goss, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

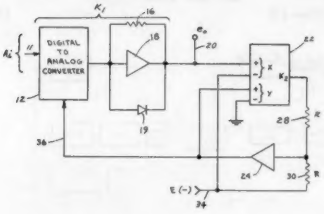
Filed Jun. 15, 1979, Ser. No. 48,871
Int. Cl.³ G11B *21/08*; G05B *13/00*
U.S. Cl. 360—78 **2 Claims**

1. In a control circuit for controlling a transducer in movement from one position to another, the improvement comprising a function generator for controling said movement wherein

said function generator is adapted to receive an input signal representative of the instantaneous position of the transducer and the desired new position and has an output signal which is adapted to control movement of said transducer, wherein said function generator is comprised of:

input signal means having first and second inputs for producing an output signal representative of electronic analog combination of signals received at said first and second inputs, wherein said first input signal is a signal representative of the difference between the instantaneous position of the transducer and the desired new position and wherein said second input signal is an internal reference voltage signal,

summation amplifier means for receiving the output signal of said input signal means, said amplifier means producing an output signal which is the function generator output signal,



an electronic analog multiplier having first and second input pairs, the positive terminal of said first pair being connected to the output of said function generator,

a first and second resistor in series, said first resistor being connected to the output of said multiplier and said second resistor being connected to the negative terminal of said first input pair of said multiplier,

operational amplifier means for receiving an input from the connection between said first and second resistor and providing an output to the positive terminal of said second input pair of said multiplier and to said second input of said input signal means as the internal reference voltage, and

an external reference voltage source connected to said second resistor, the adjustment of said external voltage source causing an adjustment in the output signal amplitude of said function generator and wherein the output of said function generator contains a square root function of the input.

4,257,075

TAPE MAGAZINE AND RECORDING AND/OR PLAYBACK MACHINE WITH IMPROVED MAGAZINE LOCATING AND LOADING STRUCTURE

Steve S. Wysocki, North St. Paul; Norman E. Nelson, and Peter J. Vogelgesang, both of Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 23, 1979, Ser. No. 23,301
Int. Cl.³ G11B *23/06, 15/26, 15/60*
U.S. Cl. 360—96.5 **6 Claims**

1. In combination

a magazine comprising:

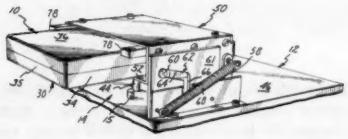
a support member comprising a generally cylindrical hub portion having a central opening and having a slot extending axially across its full width and communicating with said central opening;

an endless length of strip material having a major portion wound in a coil about said hub portion and a minor portion extending from the innermost wrap of the coil through said slot, partially across said central opening and around the side surface of the coil to the outermost wrap of the coil; and

a case enclosing said support member and endless length of strip material, said case including a base wall portion overlaying the side of said support member, said base wall portion having three openings in predetermined spaced locations adjacent said support member; and

a recording and/or playback machine comprising:

means defining a station for releasably receiving said magazine in a predetermined position on said machine, said means for releasably receiving comprising three spaced support pins having terminal end portions adapted for entering the openings in said case to engage and support a surface of said support member; drive means having members adapted to be positioned within the central opening of said magazine when said magazine is positioned in said station for making driving



engagement with said strip material to pull said strip material through said slot from said coil with the edges of said strip material between said drive means and said slot generally coplanar with the edges of said coil;

a transducer adapted to be positioned within said central opening along said strip material between said drive mechanism and the slot in said hub portion when said magazine is positioned at said station; and

an edge guide for said strip material adapted to be positioned within said central opening adjacent said transducer to guide said strip material past said transducer along a predetermined path;

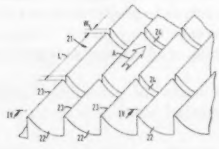
the terminal end portion of said support pins being positioned at a precise location with respect to said edge guide to precisely position said support member so that said coil can shift axially on said hub to align the edges of said coil with the edges of said strip material at said edge guide.

4,257,076

GROOVED DRUM FOR TAPE RECORDING AND/OR REPRODUCING APPARATUS

Yukihiko Shimizu, Tagajo, and Kazunori Ozawa, Tomiya, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1979, Ser. No. 29,753
Claims priority, application Japan, Apr. 17, 1978, 53-44938
Int. Cl.³ G11B *5/52, 15/60, 21/04*
U.S. Cl. 360—130.24 **12 Claims**



1. A helical scan video tape recording and/or reproducing apparatus comprising a guide drum having a peripheral surface for guiding a longitudinally transported video tape wrapped helically thereon, at least one rotary head projecting from said surface for recording signals on said tape and/or reproducing

signals from said tape by obliquely scanning said tape on the guide drum, and first grooves formed in said peripheral surface for preventing interference with smooth transport of said video tape due to buildup of moisture between said drum and said video tape, the lengths of said first grooves being substantially parallel to the direction of transport of said tape and each said first groove including a wall portion disposed at an acute angle greater than 3 degrees to a line joining the crests of said grooves and normal to said direction of transport of said tape.

4,257,077

PRESSURE PAD AND SHIELDING PLATE FOR A TAPE CASSETTE

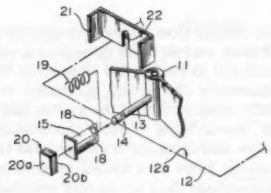
Toshihiko Ishida, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1979, Ser. No. 21,172

Claims priority, application Japan, Apr. 1, 1978, 53-42759[U]; Apr. 3, 1978, 53-43609[U]

Int. Cl.³ G11B *23/08, 15/60*

U.S. Cl. 360—130.33 **7 Claims**



1. A tape cassette comprising:
a casing for said tape;
an opening in said casing for a magnetic head, said tape adapted to be moved past said opening for contact by one side of said tape with said head;
a magnetic shielding plate fixed in said casing at a location adjacent said opening and on the other side of said tape;
a supporting arm fixed to said casing and extending from at least said magnetic shielding plate towards said tape;
a movable body supported by said supporting arm for movement towards and away from said tape only; and
resilient means disposed between said supporting arm and said movable body, said resilient means adapted to bias said movable body towards said tape;
whereby said tape may be moved by said head towards said shielding plate against the biasing force of said resilient means.

4,257,078

READ DEVICE FOR PLANE MAGNETIC RECORDING MEDIUM

Fujio Shibata, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

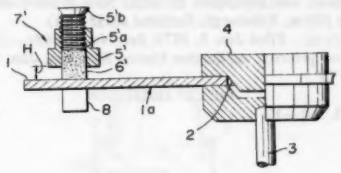
Filed Mar. 13, 1979, Ser. No. 20,062

Claims priority, application Japan, Apr. 10, 1978, 53/46758[U]

Int. Cl.³ G11B *15/60, 5/012*

U.S. Cl. 360—130.34 **3 Claims**

1. In a read device for reading magnetic data stored in a plane magnetic recording medium, comprising:
a magnetic head for reading magnetic data stored in a rotatable flexible plane magnetic recording medium; a pressure pad support mounted adjacent a rear surface of the recording medium and spaced a predetermined distance from the recording medium; and a pressure pad carried in the support and projecting therefrom toward and into contact with the rear surface of the magnetic recording medium to urge the recording medium in a direction of the magnetic head so as to contact a front surface of the magnetic recording medium with the magnetic head, the improvement comprising screw means carried by the support and engaging the pad for adjusting a projected or



displaced distance of the pad toward the magnetic recording medium, to thereby compensate for wear and the like.

4,257,079

APPARATUS FOR REWINDING MAGNETIC TAPE IN VIDEO CASSETTE

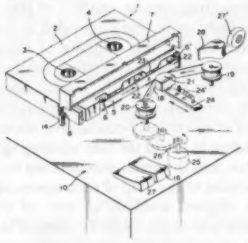
Keiichi Yoshizawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 16, 1979, Ser. No. 39,354

Claims priority, application Japan, Jun. 9, 1978, 53-78061

Int. Cl.³ B08B *1/02, 5/00*; G11B *23/00*

U.S. Cl. 360—137 **4 Claims**



1. In an apparatus for rewinding a magnetic tape in a video cassette, said cassette including at least one exterior flat surface over which said tape passes during rewinding, a tape cleaning device comprising:
a movable pushing pad located opposite said flat surface from said magnetic tape;
a cleaning tape extending between said movable pushing pad and said magnetic tape, said cleaning tape normally in contact with said pushing pad;
a supply reel and a take up reel for said cleaning tape;
means for continuously driving at least one of said reels only when said magnetic tape is rewound, said means adapted to rotate said at least one reel in a direction which moves said cleaning tape opposite the direction of said magnetic tape; and
means adapted for moving said pushing pad adjacent said exterior flat surface of said cassette, with said cleaning and magnetic tapes positively held therebetween, to thereby clean said magnetic tape, said means for moving said pushing pad being actuated by the rewinding of said magnetic tape.

4,257,080

CURRENT LIMITING DEVICES

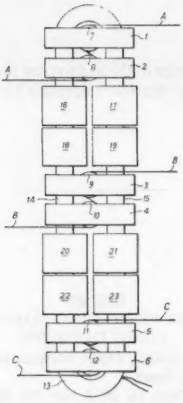
Trevor C. Bartram, Fossway, Newcastle upon Tyne NE6 2YD, England, and Bendapudi P. Raju, NEI Bruce Peebles Ltd., East Pilton, Edinburgh, Scotland (EH5 2XT)

Filed Jun. 8, 1979, Ser. No. 46,766

Claims priority, application United Kingdom, Jun. 13, 1978, 26841/78

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—19 **6 Claims**



1. A current-limiting device for an alternating current system comprising for each phase at least two iron-cored saturable reactors each of three limbed, double-window configuration with an alternating current winding of that phase wound about its centre limb, there being provided at least one superconducting direct current bias winding of elongated closed-loop configuration, the loop extending substantially in one plane and having two substantially parallel sides, at least one air-gap magnetic core linking each superconducting bias winding and a screen of electrically-conductive material surrounding the bais winding to shield the bias winding against alternating magnetic flux, and the arrangement being such that one of the two parallel sides of the loop of each screened bias winding passes through aligned windows of two of the iron-cored saturable reactors which are spatially parallel to one another while the other of the parallel sides passes through the other windows of the said two reactors.

4,257,081

CIRCUIT ARRANGEMENT FOR THE CONTROL OF A BISTABLE RELAY

Hans Sauer, Deisenhofen; Wolf Steinbichler, Bad Feilnbach; Heinz Ritter, Schongau, and Sepp Antonitsch, Otterfing, all of Fed. Rep. of Germany, assignors to Matsushita Electric Works Ltd., Tokyo, Japan and SDS-Electro GmbH, Deisenhofen, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,926

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1977, 2747607

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—156 **22 Claims**

1. A control circuit arrangement, comprising:

a bistable relay having an excitation coil for energizing the relay between first and second positions;

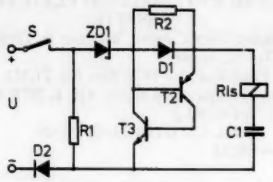
a capacitor having a storage capacity sufficient to energize said relay;

circuit means coupling said capacitor in series with said coil for providing all the current flow through said coil from said capacitor during charging and for blocking all current flow through said coil by said capacitor when said capacitor is charged;

a resistance element coupled in series with said series-coupled capacitor and coil;

an excitation voltage source coupled in parallel with said series-coupled coil, capacitor, and resistance element; and

a semiconductor switch means having a controlling electrode coupled to detect the voltage drop across said resistance element, and having outputs coupled in parallel across said series-coupled coil and capacitor, so that



when the voltage from said source exceeds a first predetermined level, current flows through said resistance element and said coil to switch said relay to its first position and simultaneously charge said condensor to a voltage substantially equal to that of the source, said semiconductor switch means being thereby rendered non-conductive, and when said capacitor is charged and the voltage from said source drops to a second predetermined level, the reduced voltage drop across said resistance element renders said semiconductor switch means conductive, allowing said capacitor to discharge through said coil to switch said relay to its second position.

4,257,082

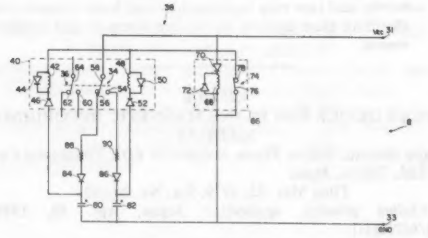
MAGNETIC FLIP-FLOP FOR HYDROPHONE PREAMPLIFIER

Craig K. Brown, Winter Garden, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 16, 1979, Ser. No. 95,111

Int. Cl.³ H01H *47/00*

U.S. Cl. 361—191 **13 Claims**



1. In combination with electrical equipment of the type obtaining its power from a two-conductor cable, one line connected to the positive side and the other to the ground side of a suitable DC power supply, including at least one switch available for desired switching connections, the improvement comprising:

a non-latching magnetic relay and an associated single-pole, single throw normally-closed switch, the coil of the relay being connected between the positive side and ground of the incoming power cable and one contact of the switch being connected to ground;

a latching magnetic relay having energizing and deenergiz-

ing coils and an associated multiple-pole, double-throw switch with at least one double-throw section being the available switch for the desired switching connections, said latching relay having one side of its coils connected together and to the other side of the switch of the non-latching magnetic relay; and

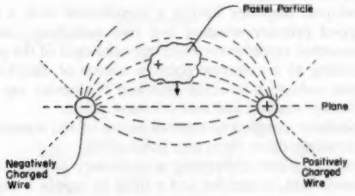
network means connected to the contacts of one of the poles, and to the other side of the coils of said multiple pole latching magnetic relay for switching the poles of the relay from one switch contact to the other upon turning on and off of the power source to said cable.

4,257,083

PROCESS FOR PRESERVING PASTEL WORKS OF ART

Victoria S. Blyth, 1158 Palms Blvd., Venice, Calif. 90291

Continuation of Ser. No. 954,347, Oct. 25, 1978, abandoned.
This application Oct. 22, 1978, Ser. No. 86,700
Int. Cl.³ H01N *13/00*
U.S. Cl. 361—234 **2 Claims**



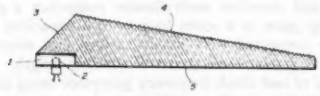
1. A process for preserving pastel works of art which comprises the following steps: providing a panel having a multiplicity of conductors attached thereto interconnected to form two groups insulated from one another; placing the pastel work to be preserved on the panel; and applying and maintaining an electric potential across the two groups of conductors to establish an electrostatic field at the surface of the panel to attract the pastel particles of the work of art into the plane of the panel and to hold the pastel particles firmly in fixed positions on the surface of the paper or other medium which forms the substrate for the work of art.

4,257,084

DISPLAY DEVICE

Christopher H. Reynolds, 314 Grove St., Westwood, Mass. 02090

Filed Feb. 21, 1979, Ser. No. 13,745
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—31 **8 Claims**



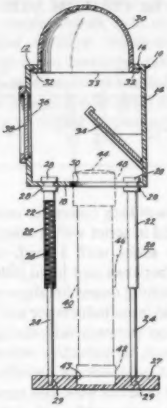
1. A light-projecting device comprising an integral unit of material that is at least translucent, said unit including light-diffusing surfaces, a chamber dimensioned to accommodate a plurality of sources of varicolored light, and reflecting surface disposed at an angle relative to said light diffusing surfaces such as to reflect by means of total internal reflection the light cast from the chamber to said diffusing surfaces which ar textured to cast said light towards the user.

4,257,085

WARNING LANTERN ADAPTER

Robert M. Kimmel, 8721 Patton Rd., Wyndmoor, Pa. 19118

Filed May 8, 1979, Ser. No. 37,208
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—186 **14 Claims**



1. Apparatus for illuminating a work area while simultaneously providing a safety beacon-type warning light comprising:

means for holding an independently operable, normally hand-held source of illumination which provides a first directional light beam;

means for diverting a portion of said first directional light beam from said source of illumination of said work area, in a second directional light beam; and,

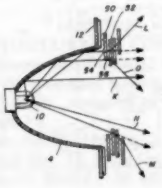
structure providing an omni-directional beacon-type warning light which utilizes the remainder of light from said first directional light beam not being diverted to said work area.

4,257,086

METHOD AND APPARATUS FOR CONTROLLING RADIANT ENERGY

John E. Gulliksen, Shrewsbury, Mass., assignor to Koehler Manufacturing Company, Marlborough, Mass.

Filed Oct. 22, 1979, Ser. No. 87,428
Int. Cl.³ G03B *27/76*; F21Y *13/04*; G03B *9/02*
U.S. Cl. 362—279 **13 Claims**



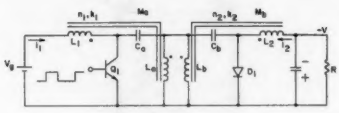
1. A luminaire apparatus comprising a housing, a source of radiant energy located in the housing, a diaphragm structure mounted on the housing and consisting of radiation transmitting elements which include refracting components and means for rotatably adjusting the diaphragm structure and varying distribution of radiant energy projected from the housing between spot and flood configuration.

4,257,087

dc-TO-dc SWITCHING CONVERTER WITH ZERO INPUT AND OUTPUT CURRENT RIPPLE AND INTEGRATED MAGNETICS CIRCUITS

Slobodan M. Cuk, Huntington Beach, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 2, 1979, Ser. No. 26,541
Int. Cl.[3] H02M 3/335
U.S. Cl. 363—16 20 Claims



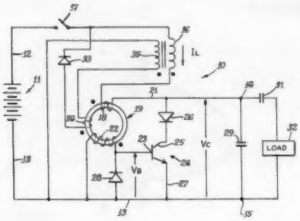
1. In a dc-to-dc switching converter comprised of an input inductance connected in series with a source, an output inductance connected in series with a load, storage capacitance connected in series between said input inductance and output inductance, and switching means for alternatively connecting a junction between said input inductance and said storage capacitance, and a junction between said storage capacitance and said output inductance, to respective return current paths for said source and load, said storage capacitance being divided into a first capacitor in series with said input inductance and a second capacitor in series with said output inductance, an improvement comprising electromagnetic induction means for connecting said first capacitor to the return current path for said source and connecting said second capacitor to the return current path for said load, and said electromagnetic induction means having at least one winding and a magnetic circuit with at least two flux paths, one flux path for coupling said input inductance and a winding of said induction means, and another flux path for coupling said output inductance and a winding of said induction means.

4,257,088

HIGH-EFFICIENCY SINGLE-ENDED INVERTER CIRCUIT

Ole K. Nilssen, Caesar Dr., Rte. 4, Barrington, Ill. 60010

Filed Apr. 25, 1979, Ser. No. 33,335
Int. Cl.[3] H02M 3/335
U.S. Cl. 363—18 14 Claims



1. In a single-ended Class C oscillator having a tuned L-C tank circuit, the improvement comprising:

power transistor means having a control element; and

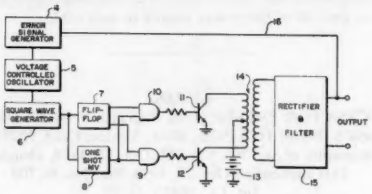
saturable core feedback transformer means for supplying intermittent feedback signals to the control element of the transistor means in order to effect periodic transistor means conduction.

4,257,089

REGULATED VARIABLE FREQUENCY DC/DC CONVERTER

James C. Ravis, Excelsior, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1979, Ser. No. 75,309
Int. Cl.[3] H02P 13/22
U.S. Cl. 363—25 2 Claims



1. A regulated DC/DC converter with variable frequency control, comprising:

a push-pull amplifier having a transformer with a center-tapped primary winding and two switching transistors connected respectively from opposite ends of the primary winding to a common point, a source of direct-current input voltage connected between the center tap of the primary winding and said common point;

a modulator coupled to control inputs of the transistors to alternately drive them into conduction;

an output circuit comprising a secondary winding of said transformer, a rectifier and a filter to supply a regulated output direct-current voltage;

an error signal generator coupled between said output circuit and said modulator to generate an error signal voltage proportional to the departure of said output voltage from a desired value;

said modulator comprising a clock frequency generator, a one-shot multivibrator to produce a pulse of constant length, a flip-flop, and two coincidence gates;

wherein said clock frequency generator consists essentially of first and second inverting gates, a capacitor and a first resistor connected in series to form a loop, a second resistor connected from the conjunction of the first and second inverting gates to the junction of the first resistor and capacitor, and a field effect transistor in series with a third resistor also connected from the junction of the first and second inverting gates to the junction of the first resistor and capacitor, with the field effect transistor having a gate electrode connected via a diode to the output of the error signal generator, so that the clock frequency generator produces a square wave output signal at a frequency which is continuously variable controlled by said error signal voltage changing the resistance of said field effect transistor, the frequency being within a range determined by said second and third resistors in combination with the first resistor and capacitor;

wherein said one-shot multivibrator comprises a pair of inverting gates in a series loop with a capacitor, and a resistor connected to a direct current bias source, arranged to produce said pulses of constant length;

the output of said clock frequency generator being coupled to inputs of the flip-flop and the one-shot multivibrator to trigger the flip-flop to change state once each clock cycle in response to a transition of the clock cycle in one direction so that the flip-flop is effectively a two-to-one frequency divider, and to trigger the one-shot multivibrator to initiate said pulse of constant length during each cycle in response to the transition in the opposite direction from that which triggers the flip-flop;

the output of the one-shot multivibrator being coupled to apply the same signal to both of said coincidence gates, and the flip-flop having its conjugate outputs connected to

different ones of said coincidence gates, said coincidence gates outputs being the outputs of said modulator which alternately apply said pulses of constant length to alternate control inputs of said push-pull amplifier.

4,257,090

CIRCUIT FOR DEFINED CURRENT SHARING BETWEEN PARALLEL-CONNECTED SWITCHING REGULATOR MODULES IN DC SWITCHING REGULATORS

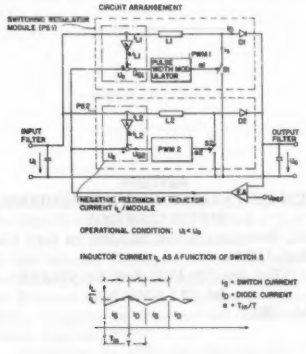
Hans Kröger; Wolfgang Müller, both of Markdorf, and Wolfgang Denzinger, Immenstaad, all of Fed. Rep. of Germany, assignors to Dornier System GmbH, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,444

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754846

Int. Cl.³ H02M *3/22*

U.S. Cl. 363—65 **3 Claims**



1. In a circuit arrangement for defined current sharing between parallel-connected switching regulator modules in DC switching regulators with continuous inductor current and common error amplifiers for the purpose of generating regulated DC voltage from an unregulated voltage source,

the improvement comprising means in each switching regulator module composed of an inductor, a semi-conductor switch, a free-wheeling diode, and a pulse-width modulator, whereby for the purpose of controlling the pulse-width modulator a signal proportional to the time-varying inductor current of the individual switching regulator module is negatively fed back to the output signal of the error amplifier and where the signal resulting therefrom is used to control the pulse-width of the corresponding switching regulator module.

4,257,091

ELECTRICAL POWER CONVERTER THYRISTOR FIRING CIRCUIT HAVING NOISE IMMUNITY

Lance R. Kaufman, 131 White Oak Way, Mequon, Wis. 53092

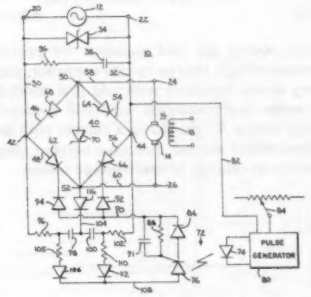
Filed Nov. 21, 1978, Ser. No. 962,584

Int. Cl.³ H02P *13/24*

U.S. Cl. 363—85 **6 Claims**

1. In a power control circuit having a pair of buses connectable to an a.c. power source and having at least one controllable current conduction means having a power circuit and a firing signal responsive control circuit including a controlled gatable rectifier having an anode circuit and a cathode circuit for conducting controlled amounts of energy to a load, said power circuit being connected to said a.c. buses for receiving the alternating current, an improved firing circuit comprising:

a light activated silicon controlled rectifier having an anode and a cathode coupled to said control circuit for providing firing signals to said control circuit; light means for activating said silicon controlled rectifier; resistive-capacitive means comprising at least one series connected resistor and capacitor pair connected across said a.c. buses and having a tap intermediate said resistor and capacitor connected to said anode of said controlled rectifier for providing a voltage that is reduced with



respect to the voltage in said buses to said anode for providing firing signals when said controlled rectifier is activated while rendering said firing circuit immune to transient voltage spikes in said a.c. buses, and diode means electrically connecting said capacitor to said cathode circuit of said control circuit to maintain the charge at said capacitor.

4,257,092

TRACTION MOTOR CURRENT CONTROL APPARATUS

Frank J. Prines, Murrysville; Thomas C. Matty, North Huntingdon Township, Westmoreland County, and James H. Franz, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 803,194, Jun. 3, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 968,950

Int. Cl.³ H02M *3/32*; H02P *7/28*

U.S. Cl. 363—124 **12 Claims**

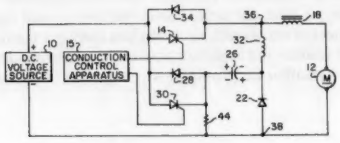
1. In chopper apparatus operative with a direct current voltage source and having an output for controlling the energization of a load, the combination of

first controllable rectifier means connected to provide a load current path between said voltage source and said output,

conduction control means for determining the ON condition of operation of the first controllable rectifier means to supply current to said output,

commutation means for determining the OFF condition of operation of the first controllable rectifier means and including a capacitor and an inductor coupled with the first controllable rectifier means,

second controllable rectifier means connected between the



voltage source and said capacitor for providing a first direction voltage charge to said capacitor, and

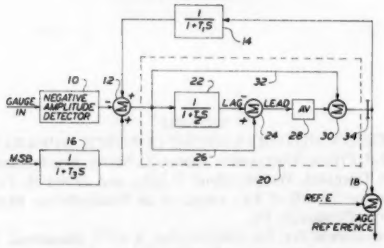
charging means operative with said first controllable rectifier means and connected with said capacitor and said voltage source for providing a current path to maintain a predetermined second direction voltage charge of said capacitor in relation to said voltage source.

4,257,093

NOMINAL ADAPTIVE CONTROL USING MOST RECENT EXCURSION IN A PROPERTY VARIATION

Robert C. Peirson, Murrysville, Pa.; James R. Vanada, Pleasant Valley, Iowa, and Paul C. Donatelli, Trafford, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 15, 1979, Ser. No. 20,646
Int. Cl.[3] G05B *13/02*; G06F *15/46*
U.S. Cl. 364—105 **4 Claims**



1. A method of automatically maintaining a nominal property value of a material near a limiting value in the process of making the material, the method comprising the steps of

imparting to the material a property that varies about the nominal property value,

measuring said property and producing a signal that is representative thereof, the measured property and resulting signal having positive and negative excursions about the nominal value,

determining the amplitude of the most recent excursion,

adjusting the nominal value of the property relative to a predetermined limiting value in response to the amplitude of the most recent excursion, and

continually evaluating the amplitude of the excursions and continually adjusting the nominal value toward or away from the limiting value in respective response to a decrease or increase in the amplitude of the most recent excursion relative to the amplitude of the excursion immediately preceding the most recent excursion.

4,257,094

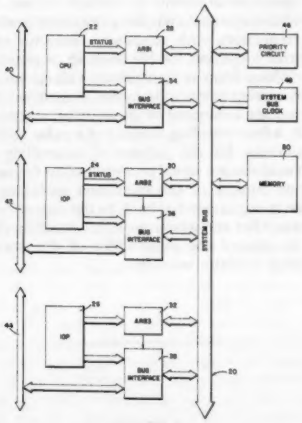
Patent Not Issued For This Number

4,257,095

SYSTEM BUS ARBITRATION, CIRCUITRY AND METHODOLOGY

James Nadir, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1978, Ser. No. 921,083
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—200 **21 Claims**



1. An arbitration circuit coupled to a system bus for arbitrating access and control of a system bus among a plurality of circuits for generating requests for command signals and transferring digital information, said circuits having an ordered priority of access to said system bus, said arbitration circuit

having an assigned priority to said system bus together with at least one circuit for transferring digital information from and to said system bus, said one circuit having at least one mode of operation and at least one status of operation within said mode comprising:

first means for detecting the status and mode of operation of said one circuit;

second means for requesting and obtaining control of said system bus in response to said mode and status detected by said first means, said first and second means being coupled, said second means being coupled to said system bus; and

third means, coupled to said first and second means, and to said system bus for selectively surrendering control of said system bus on both lower and higher priorities than said assigned priority of said one circuit, said surrendering including entry of said one circuit into an idle status in the presence of a lower priority request from another circuit, and entry of said one circuit into a non-accessing status with respect to said system bus in the presence of a lower priority request from another circuit;

whereby said system bus may be intelligently utilized to maximum efficiency by allowing a lower priority circuit access to said system bus without altering said assigned priority.

4,257,096

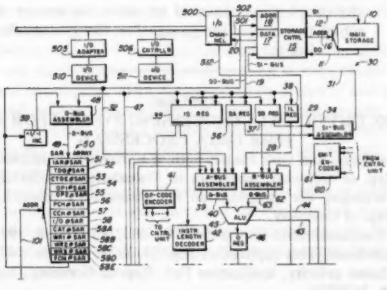
SYNCHRONOUS AND CONDITIONAL INTER-PROGRAM CONTROL APPARATUS FOR A COMPUTER SYSTEM

J. Warren McCullough, Rochester, Minn.; Terrell A. Poland, Davenport, Iowa; Dale N. Reynolds, Rochester, Minn.; Keith K. Slack, Rochester, Minn., and Richard T. Turner, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,501

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **52 Claims**



1. Synchronous program control apparatus for a processor of a computer system for transferring control of the processor from an invoking program to an entry point of an invoked program and back, comprising:

transfer initiation means for selectively locating a function control means of a function control array, with the entry point of the invoked program being determined by said function control means;

status save means conditionally obtainable by said transfer initiation means to save the status of the invoking program;

initialization means for initializing the invoked program to pre-selectable, locatable parameters of the invoking program; and

transfer return means to return processor control from the invoked program to the invoking program at the completion of the invoked program, whereby the invoking program is modifiable to pre-selectable, locatable parameters of the invoked program and said status save means is conditionally releasable.

4,257,097

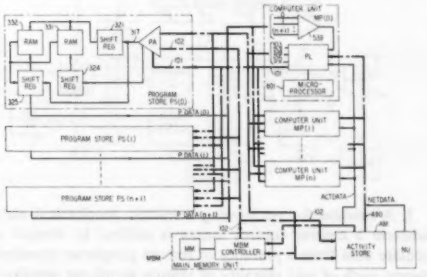
MULTIPROCESSOR SYSTEM WITH DEMAND ASSIGNABLE PROGRAM PAGING STORES

John C. Moran, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 11, 1978, Ser. No. 968,446

Int. Cl.³ G06F *9/46, 15/16*

U.S. Cl. 364—200 **11 Claims**



1. A data processing system comprising:

a plurality of cache program stores ($PS_{(o)}$-$PS_{(n+1)}$) for storing programs;

a main memory unit (MBM) for storing programs and for being responsive to computer unit signals for transmitting programs to said cache program stores;

a plurality of computer units ($MP_{(o)}$-$M_{(n)}$) for executing programs stored in said plurality of cache program stores on a nondedicated basis; and

first transmission means (**101, 102, 103, 104, 105**) interconnecting said plurality of cache program stores, said plurality of computer units and said main memory unit; characterized in that

said plurality of cache program stores is greater in number than said plurality of computer units;

said data processing system further comprising activity memory means (**2001, 2002, 2003**) for specifying the next program to be transmitted by said main memory unit and specifying the cache program store to which said main memory unit is transmitting;

second transmission means (**ACTDATA, 490**) for interconnecting said activity memory means and said plurality of computer units;

each of said computer units includes means for accessing said activity memory means and responsive to the content of said activity memory means for generating and for transmitting to said main memory unit said computer signals defining said next program and the cache program store to be loaded and for seizing the cache program store defined by said activity memory means which has previously been caused to be loaded from the main memory unit by another computer unit and for updating said activity memory means, upon completion of a program in a previously assigned cache program store, whereby, said computer units are executing programs out of temporarily

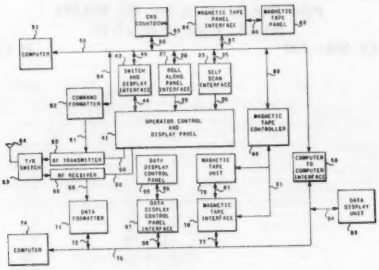
assigned cache program stores while the main memory unit is loading another program into an unassigned cache program store.

4,257,098

COMPUTER TO RECORDING MEDIUM INTERFACE

Robert H. Lacy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,905
Int. Cl.[3] G01V *1/28, 1/24*
U.S. Cl. 364—200 16 Claims



1. A method for performing a seismic geophysical survey wherein a central control means is utilized to control and acquire data from a plurality of remote geophone monitoring means, each of said plurality of remote geophone monitoring means being adapted to receive analog electrical signals from at least one geophone means, comprising the steps of:

activating at least one of said plurality of remote geophone monitoring means;

providing analog electrical signals, representative of seismic waves, from at least one of a plurality of geophone means to a respective one of each activated remote geophone monitoring means, said remote geophone monitoring means performing preselected data processing operations on said analog electrical signals, said preselected data processing operations comprising the steps of:

sampling said analog electrical signals; and

converting the thus sampled analog electrical signals from analog form to digital form;

transmitting the sampled electrical signals, which have been converted to digital form, as seismic data to said central control means; and

storing said seismic data on a recording medium in said central control means, said step of storing said seismic data on a recording medium in said central control means comprising the steps of:

using a central computer to control said recording medium;

using a peripheral computer, under the control of said central computer, to supply said seismic data to said recording medium to be recorded;

detecting an error in the transfer of said data from said peripheral computer to said recording medium;

supplying an indication that an error has been detected, in the transfer of said data from said peripheral computer to said recording medium, to said central computer; and

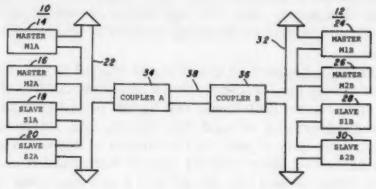
using said central computer to command said peripheral computer to retransmit said data to said recording medium to thereby correct the error which occurred in the previous transfer of said data from said peripheral computer to said recording medium.

4,257,099

COMMUNICATION BUS COUPLER

Daren R. Appelt, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 622,318, Oct. 14, 1975. This application Jun. 27, 1978, Ser. No. 919,644
Int. Cl.[3] G06F *9/46, 15/16*
U.S. Cl. 364—200 5 Claims



1. A data processing system comprising at least two communication buses, at least one master device and one slave device connected to each of the buses, each of the master devices including means for providing a go signal and an address, each of the communication buses being the communication link between master devices and slave devices connected to the bus, the system having a coupler structure for providing a communication link between two communication buses, the coupler structure comprising:

(a) a first and second coupler connected to the first and second of the communication buses, respectively, the first and second couplers being connected by a coupler bus having means for carrying control and address signals:

(b) each of the couplers further comprising:

(1) means responsive to a go signal and an address, both generated by a master device connected to the bus to which the coupler is connected to transmit a start signal and an address to the other of the couplers, and

(2) means responsive to a start signal and address transmitted by the other of the couplers to transmit control signals and an address to the communication bus to which the coupler is connected;

(c) at least one of the couplers further comprising:

(1) means for detecting the simultaneous occurrence of a start signal transmitted by itself and a start signal transmitted by the other of the couplers, and

(2) means responsive to said means for detecting to transmit a wait signal on the communication bus to which the coupler is connected to cause the master device which transmitted the go signal on that bus to relinquish control of the bus.

4,257,100

ELECTRONIC DATA PROCESSING SYSTEM FOR REAL TIME DATA PROCESSING

Max Syrbe, and Dirk Heger, both of Karlsruhe-Waldstadt, Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 603,213, Aug. 8, 1975, abandoned. This application Sep. 29, 1978, Ser. No. 947,224
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1974, 2438536
Int. Cl.[3] G06F *15/16, 11/20*
U.S. Cl. 364—200 9 Claims

1. An electronic data processing system for real time data processing comprising

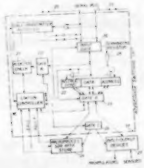
(a) a main computer station for supporting man-machine communication and application program development and system maintenance;

(b) a plurality of microcomputer stations at spaced locations and coupled to said main computer station, each of said microcomputer stations comprising

(1) an input power supply;
(2) a resettable time-out circuit coupled to said power supply;
(3) an internal working storage coupled to said power supply;
(4) a microprocessor coupled to said internal working storage;
(5) input/output devices coupled to said working storage;
(6) a test control loop coupled to said input/output devices;
(7) an interchange switch means including switching gates; and
(8) a station controller for controlling the switching state of said switching gates;

(c) a ring bus system for interconnecting said plurality of microcomputer stations through said interchange switch means for conveying messages between said computer stations in a bitserial mode, said ring bus system providing two independent paths;

(d) fault detecting means in each of said microcomputer stations, said fault detecting means comprising a station controller for monitoring activities on internal paths including activities of said power supply, said working storage, and said resettable time-out circuit, and for monitoring outside activities including activities of said ring



bus and outputs of programs stored in said working storage for producing defined signals in real time for controlling said test loop;

said fault detection means including means for generating fault reports, including a status word stored in the station controller, and including means for transmitting status reporting messages to each other microcomputer station for triggering external control by another computer of said system through control of the switching state of said switching gates in said interchange switching unit, said station controller receiving said status reporting messages in accordance with the transmitting or receiving activity on the ring bus;

whereby, failure of one of said microcomputers consisting of said microprocessor and said working storage causes said microcomputer to be disconnected by means of said gates and another microcomputer station of the system triggered in said manner supplies said input/output devices by means of messages conveyed by said ring bus and said gates; and

whereby failure of one of said interchange units or said ring bus closes one of said gates and the exchange of messages with other computer stations is suspended and the associated microcomputer supplies the input/output devices in an isolated manner.

4,257,101

HARDWARE IN A COMPUTER SYSTEM FOR MAINTENANCE BY A REMOTE COMPUTER SYSTEM

Thomas O. Holtey, Newton, and Kin C. Yu, Burlington, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

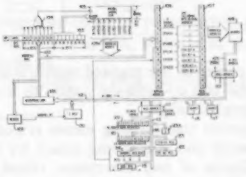
Filed Jan. 2, 1979, Ser. No. 314
Int. Cl.[3] G06F *15/16*
U.S. Cl. 364—200 **10 Claims**

1. In a computer system having at least one communication channel for establishing communication with another computer system, one microprocessor, one universal asynchronous receiver transmitter (USART), one register and a memory, a U-bus for coupling said USART to said micrprocessor, an I-bus for coupling said register to said U-bus, and an M-bus for coupling said memory to said U-bus, a remote maintenance addressing apparatus for performing maintenance via said communication channel comprising:

(a) said microprocessor generating address signals representative of virtual addresses of a first predetermined number of address locations in said memory;

(b) signal generating means coupled to said microprocessor and responsive to a first group of said address signals for generating a plurality of control signals;

(c) first means for storing information signals for modifying said virtual addresses into real addresses for a second predetermined number of address locations in said memory;



(d) second means coupled to said microprocessor and said first means and responsive to a first group of said plurality of control signals in a first state for selecting said address signals for addressing said first predetermined number of address locations; and

responsive to said selected ones of said first group of said plurality of control signals in a second state for selecting said information signals for generating said address signals for addressing said second predetermined number of address locations greater than said first predetermined number of address locations; and,

(e) third means coupled to said signal generating means and said first means and responsive to a first signal of a second group of said plurality of control signals in a second state and one of said information signals for generating a signal for enabling said USART for receiving data signals from a remote computer system for transfer to said memory for performing maintenance.

4,257,102

APPARATUS FOR AXIAL TRANSVERSE TOMOGRAPHY

Isao Horiba, Nagoya; Yasuo Kuwabara, Kashiwa; Hiroshi Takagi, Tokyo, and Shigeru Satou, Matsudo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

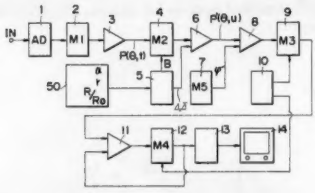
Filed Oct. 19, 1978, Ser. No. 953,773
Claims priority, application Japan, Oct. 19, 1977, 52-124570
Int. Cl.[2] G01N *23/00*
U.S. Cl. 364—414 **6 Claims**

1. An apparatus for axial transverse tomography using piercing radiation such as X-ray and γ-ray for displaying a tomographic image concerning variation of radiation absorption values at a given section of a subject under examination, comprising:

scanning means effecting a revolution-scanning around said

subject at uniform angular increments while maintaining constant relative positions of a radiation source and a radiation detector with said subject intervening therebetween;

setting means for defining a region of interest to be enlarged defined by parameters of central angle α, intercenter distance r and radius ratio R_o/R where R_o is the radius of the region scanned by said scanning means, R is the radius of said region of interest to be enlarged, the latter region being with the scanned region of radius R_o so that $R_o > R$, r is the distance between (a) the center of the scanned region and (b) the center of the region of interest to be enlarged and (c) α is the angle between the aforementioned centers in a predetermined co-ordinate system



where the center of the scanned region is located at the center of the said co-ordinate system to locally enlarge said tomographic image;

co-ordinate system transforming means responsive to said scanning means and said setting means for transforming the co-ordinates of said absorption values within said region of interest to co-ordinates in an enlarged region corresponding to the scanned region; and

means for carrying out a convolution operation on the absorption values resulting from said co-ordinate system transformation means so that the convolution operation is performed only on absorption values within said region of interest to thereby effect the enlargement of the region to be enlarged with minimal degradation of the enlarged image resolution.

4,257,103

APPARATUS FOR CONTROLLING POSITION OF A PLURALITY OF MACHINING SHAFTS EACH INCLUDING A MACHINE TOOL FITTED THERETO

Yukitomo Suzuki, and Masakazu Honda, both of Hamamatsu, Japan, assignors to Heian Iron Works, Ltd., Hamamatsu, Japan

Filed Nov. 14, 1978, Ser. No. 960,605

Claims priority, application Japan, Nov. 16, 1977, 52-137717; Jan. 26, 1978, 53-7906; Apr. 18, 1978, 53-45622

Int. Cl.³ G05B *19/417, 11/32*; G06F *15/46*

U.S. Cl. 364—474 **2 Claims**

1. A setup apparatus for use with a wood-working machine for controlling positions of multiple machining shafts to which machine tools are selectively fitted, comprising:

servomotor means for moving each of said machining shafts, and comprising a plurality of servomotors, each driving at least one of said multiple machining shafts, and each having an input terminal;

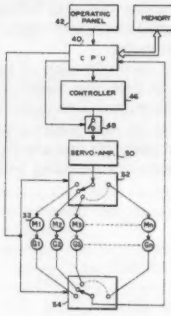
signal generator means, comprising a plurality of signal generators, one for each of said plurality of servomotors and corresponding thereto, for detecting said positions of said multiple machining shafts and for generating position signals corresponding thereto;

first selection switch means responsive to setup operation of said servomotors, moving corresponding said machining shafts to setup positions, resulting in generation of setup position signals by said signal generator means in correspondence to said setup positions, for selecting, in succession, the setup position signals from said signal generator means, and for providing same, in succession, as successive setup position signal outputs;

memory means, responsive to said successive setup position signal outputs from said first selection means, for memorizing the setup position signals generated by said signal generator means in correspondence to said setup positions together with an information showing the kind of each machining operation, as setup position data;

operating panel means for selecting a desired machining operation;

central processing means for reading out, in succession, from said memory means said setup position data of each machining shaft for the desired machining operation selected by said operating panel means, and for producing successive control signals successively designating corresponding said servomotors;



controller means for generating output signals based on the setup position data read out by said central processing means;

servo-amplifier means having an output terminal and responsive to the output signals from said controller means for generating, at the output terminal thereof, an output signal which controls the operations of said servomotors; and

second selection switch means responsive to said successive control signals generated by said central processing means for selectively connecting the output terminal of said servo-amplifier means to the input terminal of said successively designated servomotors, each said servomotor being thus controlled so as to move said at least one of said multiple machining shafts to said setup positions.

4,257,104

APPARATUS FOR SPECTRUM ANALYSIS OF AN ELECTRICAL SIGNAL

Larry R. Martin, Sebastopol, and Michael S. Marzalek, Cotati, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 10, 1978, Ser. No. 932,693

Int. Cl.³ G01R *23/00*

U.S. Cl. 364—485 **13 Claims**

1. Apparatus for use in the spectrum analysis of a signal, said apparatus comprising:

input means having inputs for receiving an input signal and a sampling signal for providing an intermediate frequency signal in response to said input signal and said sampling signal;

signal processing means coupled to said input means for providing a first digital signal in response to said intermediate frequency signal;

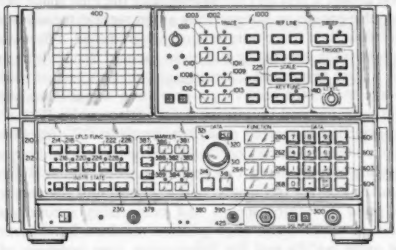
memory means coupled to said signal processing means for storing electrical representations of said digital signal in response to a memory control signal;

memory control means coupled to said memory means for providing said memory control signal;

display means coupled to said memory means for providing a waveform display in response to display control signals and said electrical representations;

display control means coupled to said display means for providing said display control signals in response to operator control signals;

operator controls coupled to said display control means for providing said operator control signals and including



means for providing a first marker control signal in response to first operator manifestations indicating it is desired to include a first visual indication with said waveform display; and

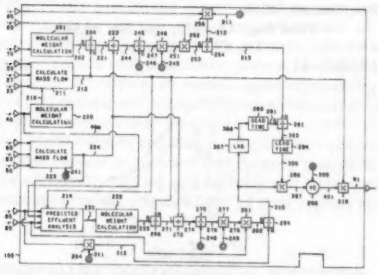
said display control means including means for causing said display means to include a first visual indication at a first predetermined position on said waveform display in response to said first marker control signal.

4,257,105

CONTROL OF A CRACKING FURNACE

Charles M. Stewart, Bartlesville, Okla., and Wilbur N. Killebrew, Jr., Phoenix, Ariz., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1979, Ser. No. 35,196
Int. Cl.³ G06F *15/46*; G06G *7/58*
U.S. Cl. 364—501 **70 Claims**



1. Apparatus comprising:

a cracking furnace means containing at least one cracking tube;

means for supplying a feed stream to said cracking furnace means;

means for supplying a diluent fluid to said cracking furnace means, said diluent fluid being combined with said feed stream;

means for supplying a fuel to said cracking furnace means, the combustion of said fuel supplying heat to said cracking furnace means;

means for removing a gaseous mixture, containing the products produced from the cracked components of said feed stream and containing said diluent fluid, from said cracking furnace means;

means for establishing a first signal representative of a prediction of the outlet velocity of said gaseous mixture from said cracking furnace means;

means for establishing a second signal representative of the actual outlet velocity of said gaseous mixture from said cracking furnace means;

means for establishing a third signal representative of a correction factor in response to said first signal and said second signal;

means for combining said first signal and said third signal to establish a fourth signal representative of a corrected prediction of the outlet velocity of said gaseous mixture from said cracking furnace means;

means for establishing a fifth signal representative of the desired outlet velocity of said gaseous mixture from said cracking furnace means;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal responsive to the difference between said fourth signal and said fifth signal; and

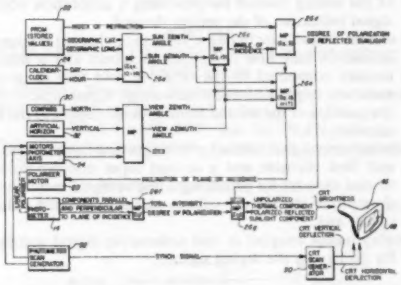
means for manipulating the flow rate of said diluent fluid to said cracking furnace means in response to said sixth signal to thereby control the outlet velocity of said gaseous mixture from said cracking furnace means.

4,257,106

METHOD AND APPARATUS FOR THERMAL IMAGING

Siegfried O. Auer, Bowie, Md., assignor to Norlin Industries, Inc., Deerfield, Ill.

Filed May 24, 1979, Ser. No. 42,112
Int. Cl.³ G01J *4/00*
U.S. Cl. 364—525 **4 Claims**



1. A device for daytime measurement of thermal radiation at a frequency which is the same as that of specularly reflected sunlight; comprising:

a photometer for detecting radiation at said frequency which arrives along a selected arrival path;

and discriminating means cooperating with said photometer to discriminate the polarized from the unpolarized components of the total radiation observed, and producing a processed output signal at least approximating said unpolarized component, said discriminating means comprising:

a linear polarizing filter interposed in front of said photometer;

calculating means calculating the position of the plane of incidence of reflected sunlight as a function of the time and place of observation;

means responsive to said calculating means for maintaining the polarization axis of said filter parallel to said plane of incidence; and

means for maintaining the attitude of said photometer so that it sights along a path of reflection from a target area at the Brewster angle relative to an estimated index of refraction of the surface of said target area, whereby the radiation sensed by said photometer is substantially only the parallel polarized component of thermal radiation;

said calculating means being responsive to said photometer

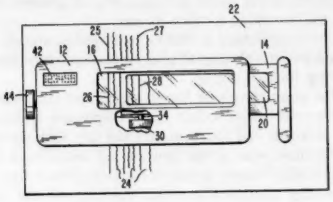
to calculate a total thermal radiation value equal to twice the parallel polarized component thereof.

4,257,107

MEASURING DEVICE

Steven B. Heymsfield, 1942 N. Decatur Rd., Atlanta, Ga. 30307, and Michael J. Sinclair, 2360 Clyde Dr., Chamblee, Ga. 30341

Filed May 22, 1978, Ser. No. 908,439
Int. Cl.³ G01B *3/08*
U.S. Cl. 364—560 **8 Claims**



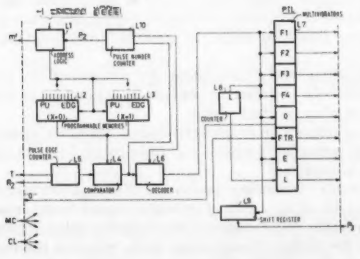
8. A measuring device comprising:
a first member having a first reference indication;
a second member having a second reference indication and movable with respect to said first member between a closed position, in which said first and second reference indications are adjacent each other, and an extended position, in which said first and second reference indications are separated;
a first rheostat adapted for connection across a voltage source and having a control permitting manual adjustment of the setting thereof for providing a calibration voltage signal indicative of the setting thereof;
a second rheostat including a resistance element connected to one of said first or second members and a moving contact connected to the other of said first or second members to provide a second voltage signal indicative of the position of the second member with respect to the first member;
a ratiometric digital voltmeter having a first input coupled to said first rheostat and a second input coupled to said second rheostat for providing a digital signal indicative of the ratio of the second voltage signal to the first voltage signal; and
display means coupled to said ratiometric digital voltmeter for displaying the digital signal.

4,257,108

PULSE GENERATOR

Anders N. E. Igel, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,765
Claims priority, application Sweden, Dec. 27, 1977, 7714753
Int. Cl.³ H03K *5/04, 5/156*
U.S. Cl. 364—900 **8 Claims**



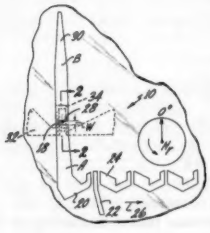
1. An improved generator for generating pulse groups during cycles of operation, each group comprising a predetermined number of pulses of predetermined pulse widths and predetermined spacings within the group, said pulses being suitable for use as synchronization and triggering pulses in a radar system, the pulse generation being carried out purely digitally by using digital circuit elements and dependent on a control frequency which is generated by an oscillator therein the improvement wherein said generator comprises controllable pulse generator means for generating the pulses of each pulse group, a first unit for determining the time space between the pulse groups and comprising a first storage means in which selectable time space numbers are programmed, a first addressing means for generating addresses for said first storage means, and a first sequential counting circuit coupled to said first storage means for receiving a presetting signal from said first storage means and outputting a time space pulse R_2 for resetting said first sequential counting circuit to the preset number supplied thereto during each cycle of operation, said sequential counting circuit being clocked by a clock signal T derived from the control frequency; and a second unit for controlling the pulse generator means and comprising second storage means in which pulse edge position numbers for determining said pulse widths and for determining time positions of said pulses are programmed in selectable storage areas, a second addressing means for generating addresses for said second storage means, a second sequential counting circuit coupled to receive said time space pulse R_2 from said first sequential counting circuit and clocked by said clock signal T, said second sequential counting circuit being reset to zero by the time space pulse R_2 supplied by said first sequential circuit so as to be advanced thereafter, and comparing and addressing means coupled to said second storage means and said second sequential counting circuit for comparing continuously the output signal of said second sequential circuit and the actual pulse edge position number from said second storage means and for generating at a detected correspondence a control signal for that one of said pulse generator means for which the pulse edge position number is intended.

4,257,109

BUBBLE NUCLEATOR

Sidney J. Schwartz, Vista, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 13, 1979, Ser. No. 65,987
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—11 **10 Claims**



1. A bubble generator on a magnetic bubble domain structure which includes means capable of supporting magnetic bubble domains thereon in response to a selected magnetic bias and which has propagate elements under which bubbles propagate element-to-element in response to a rotating in-plane magnetic field,
said propagate elements defining at least one bubble flow path,
a pair of elongated elements disposed in axial alignment and being of a material on which bubbles propagate, one of said elements being located relative to said flow path to transfer bubbles thereto,

said pair of elongated elements being separated by a gap for directing the rotating in-plane magnetic field from said one element into said means capable of supporting bubbles when said field is aligned with said pair of elements, thereby nucleating a bubble on said one element for transfer to said flow path.

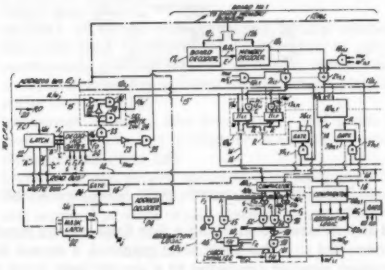
4,257,110
RECOGNITION MEMORY WITH MULTIWRITE AND MASKING

Sydney M. Lamb, Berkeley, and Randall C. Smith, Walnut Creek, both of Calif., assignors to Semionics Associates, Inc., Orinda, Calif.

Continuation-in-part of Ser. No. 788,796, Apr. 19, 1977, Pat. No. 4,149,262. This application Apr. 9, 1979, Ser. No. 28,458

Int. Cl.³ G11C *15/00*

U.S. Cl. 365—49 **13 Claims**



1. In combination in an associative memory, a plurality of random access memories each including plural random access memory modules comprising an enable port and plural information storage addresses, plural comparator means each connected to a different one of said random access memories for receiving information read out therefrom, data bus means connected to each of said memories and each of said comparator means, memory accessing means including common address bus means connected to said memories, each of said comparator means including means for comparing the information supplied thereto with information present on said data bus means and for developing an output signal representing the results of said comparison, means for storing said output result signals of said comparator means, bit mask register means including plural outputs, and masking logic means connecting said bit mask register outputs and said memory module enable ports for selectively enabling and disabling said memory module depending upon the outputs of said bit mask register means.

4,257,111
DIGITAL-TO-ANALOG OPTICAL RECORDER

Jack E. Soohoo, Fountain Valley; Michael J. McNutt, Yorba Linda; Shi-Kay Yao, Anaheim; Cecil L. Hayes, Placentia, and Richard A. Gudmundsen, Santa Ana, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 3, 1979, Ser. No. 81,418

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—114 **19 Claims**

1. A device for recording representations of a sequence of information words, each information word being composed of information bits having at least two values comprising:

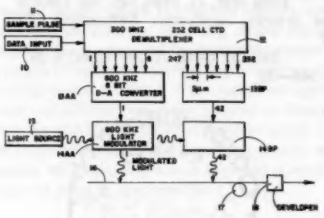
a source of digital input data comprising an input sequence of information bits, consecutive bits in said input sequence corresponding to information bits in different ones of said information words;

pulse generating means for producing a sequence of pulses;

delay means having an input connected to said pulse generating means, and a plurality of outputs for producing a sequence of time delayed pulses from said sequence of pulses;

a plurality of sampling circuits, each having a first input connected to said source of digital input data, and a second input connected to a corresponding one of said outputs of said sample pulse generating means;

each of said sampling circuits functioning to select a specific bit of said consecutive bits in said input sequence;



a digital-to-analog converter having an n-bit digital input connected to said respective sampling circuits, an n-bit information word being formed thereby where n is a positive integer, and an analog output;

a source for providing a recording signal; and

modulating means connected to said analog output of said digital-to-analog converter for modulating said recording signal in accordance with said n-bit information word.

4,257,112
ELECTRONIC TIME-PIECE WITH BAROMETRIC INDICATOR

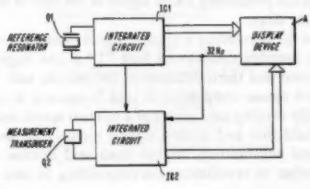
Kurt Hubner, Neuchatel, Switzerland, assignor to Ebauches Electroniques S.A., Marin, Switzerland

Filed Apr. 23, 1979, Ser. No. 32,476

Claims priority, application Switzerland, Apr. 26, 1978, 4487/78

Int. Cl.³ G04B *47/00, 47/06*

U.S. Cl. 368—11 **18 Claims**



1. An electronic timepiece with a barometric value indicator, comprising:

a reference resonator;

a first electronic circuit coupled with said reference resonator for delivering reference frequency signals, sychronization signals, and time signals;

a display device receiving said time signals for indicating the time;

a measurement transducer exposed to the ambient air generating an output signal; and

a second electronic circuit coupled with said measurement transducer, said display device, and said first electronic circuit, said second electronic circuit having means for delivering measuring frequency signals in response to said transducer output signal, and further having means for receiving said synchronization signals for periodically determining the variation of said measuring frequency relative to said reference frequency signals, said variation being caused by the barometric influence on said measurement transducer, said second electronic circuit controlling

the display of the barometric value on said display device corresponding to said measuring frequency variation.

4,257,113

ELECTROMECHANICAL CALENDAR TIMEPIECE

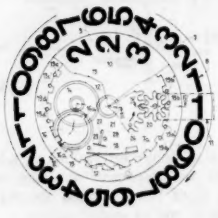
René Meister, Neuchatel, and Claude Laesser, La Chaux-de-Fonds, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Mar. 27, 1980, Ser. No. 134,670

Claims priority, application Switzerland, Apr. 4, 1979, 3107/79

Int. Cl.³ G04B *19/247*; G04C *9/08*

U.S. Cl. 368—35 **10 Claims**



1. An electromechanical calendar timepiece comprising:

means for generating time-base pulses;

a frequency divider circuit connected to receive said time-base pulses;

a motor;

a gear train driven by the motor;

time display elements driven by said gear train;

a date display system comprising a first rotatable indicating member driven stepwise by the gear train and carrying at least one set of numerals for displaying the units of the date, with two consecutive "1" for displaying respectively the "1" of the 31st and the "1" of the 1st, and a second rotatable indicating member driven stepwise by the first indicating member and carrying at least one set of numerals for displaying the tens of the date;

means for producing a first signal at the end of the months of thirty days;

means for producing a second signal when the units indicating member displays its first "1" at the beginning of the second and third decades of the month; and

control means coupled with said frequency divider for normally driving said motor at a normal speed and responsive to said first and second signals for driving the motor at a speed substantially higher than said normal speed for a number or revolutions corresponding to one day.

4,257,114

ELECTRONIC TIMEPIECE

Fukuo Sekiya, and Yuzo Maekawa, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1979, Ser. No. 10,350

Claims priority, application Japan, Feb. 16, 1978, 53/125603; Oct. 12, 1978, 53/16897

Int. Cl.³ G04G *5/04*

U.S. Cl. 368—62 **11 Claims**

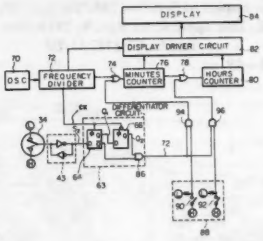
1. In an electronic timepiece powered by a battery, having a source of a standard frequency signal, a frequency divider responsive to an output signal of said source of a standard frequency signal to provide a high frequency signal pulse and a low frequency signal pulse, timekeeping means responsive to said low frequency signal pulse for producing time information, display means for displaying said time information, and externally actuated pulse generation means for generating signal pulses to be applied to said timekeeping means for modifying said time information, the improvement comprising:

a rotatable external operating member comprising a timepiece crown;

switch means coupled to said rotatable external operating member for producing an operating signal alternating between a first logic level potential and a second logic level potential in response to actuation of said rotatable external operating member;

a latch circuit for memorizing successive logic level potential transitions of said operating signal from said switch means to produce a latch output signal; and

circuit means for producing output pulses each having a pulse width of less than 0.03 seconds in response to logic level potential transitions of said latch output signal and



said high frequency signal pulse from said frequency divider;

said switch means comprising a first fixed contact member connected to a first logic level potential, a second fixed contact member connected to a second logic level, and movable contact member coupled to said rotatable external actuating member such as to be alternately set in contact with said first fixed contact member and said second fixed contact member in response to rotation of said rotatable external actuating member;

said latch circuit being responsive to actuation of said movable contact member relative to one of said first fixed contact member and said second fixed contact member, to change its stored content.

4,257,115

SWITCH STRUCTURE FOR ELECTRONIC TIMEPIECE

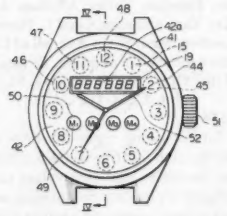
Toshikazu Hatuse, Tanashi; Minoru Natori, Tokyo; Toshikazu Shimazaki, Tanashi; Kouhei Kawanobe, Kawagoe, and Hiroshi Ogawa, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1978, Ser. No. 876,733

Claims priority, application Japan, Feb. 12, 1977, 52/14369; Mar. 7, 1977, 52/23885

Int. Cl.³ G04C *17/00*; G04B *23/02, 19/04*

U.S. Cl. 368—69 **2 Claims**



1. In an analog quartz crystal timepiece providing a multi-alarm function and having a watch case, and a watch movement adapted to drive time indicating hands and having a circuit board mounted thereon, the improvement comprising:

a time dial disposed in said watch case and including a plurality of circumferentially spaced time-indicating numerical indicia, and an access window;

an electro-optical digital display device mounted on a bottom surface of said time dial at said access window to provide a display of said multi-alarm function;

a plurality of display indicia indicative of said multi-alarm function and formed on said time dial at an area other than those in which said time-indicating numerical indicia are formed;

a watch glass plate secured to said watch case above said time dial;

a plurality of first transparent electrically conductive electrode films formed on said watch glass plate at positions corresponding to said plurality of circumferentially spaced time-indicating numerical indicia, respectively, to permit generation of input signals corresponding to said time-indicating numerical indicia, each of said plurality of transparent electrically conductive electrode films having a terminal portion formed on a bottom surface of said watch glass plate;

a plurality of second transparent electrically conductive electrode films formed on said glass plate at positions corresponding to said plurality of display indicia, respectively and serving as switches for inputting a plurality of alarm time data;

a transparent insulating film formed over said watch glass plate and said plurality of transparent electrically conductive electrode films; and

a plurality of electrically conductive connectors disposed between said circuit board and the corresponding ones of said terminal portions of said plurality of electrically conductive electrode films.

4,257,116

ELECTRONIC TIMEPIECE

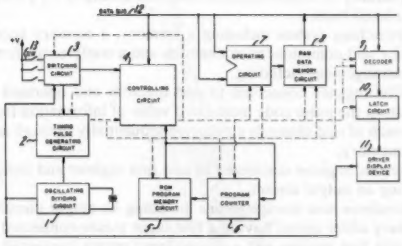
Kazuhiro Asano, and Seiko Sasaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,552

Claims priority, application Japan, May 20, 1977, 52-58386

Int. Cl.[3] **G04C** *17/00;* **G04F** *8/00;* **G04C** *15/00*

U.S. Cl. 368—69 **3 Claims**



1. An electronic timepiece, comprising: an oscillating and dividing circuit for generating repetitive signals; program memory means for storing a program which executes operations for carrying out multiple functions; a program counter for addressing said program memory means; data memory means for storing time information data and arithmetic operation data; operating means cooperative with said data memory means for executing arithmetic operations data comparison operations and data conversion operations; decoding means for decoding data to be displayed; latching means for accumulating the decoded data developed by said decoding means; display means for displaying the information represented by the decoded data accumulated in said latching means; control means receptive of program data from said program memory means for applying control signals to said program counter, said operating means, said data memory means, said decoding means and said latching means for operating the timepiece under control of the program stored in said program memory means; input switching means for applying switching signals to said control means for operating said control means, said input switching means comprising a plurality of manually operable switches, a chattering preventing circuit connected to said plurality of switches for generating chatter-free output signals in response to operation of said plurality of switches, a programmed logic array connected to receive the output signals from said chattering preventing circuit for generating the input switching means output signals in response thereto, and memory means having an input for receiving output signals from said programmed logic array and for generating output signals applied to inputs of said programmed logic array; and timing pulse generating means receptive of the repetitive signals from said oscillator and divider circuit for generating timing pulses and for applying the timing pulses to said program memory means, said program counter, said operating means, said data memory means, said decoding means and said control means for operating the same in synchronism.

4,257,117

ELECTRONIC WATCH WITH TOUCH-SENSITIVE KEYS

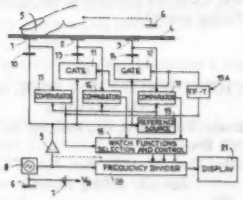
Rene Besson, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Apr. 4, 1979, Ser. No. 27,068

Claims priority, application Switzerland, Apr. 11, 1978, 3863/78

Int. Cl.[3] **G04C** *17/00, 19/00, 21/00;* **G04B** *17/12*

U.S. Cl. 368—69 **6 Claims**



1. An electronic watch comprising:

A. oscillator means providing a standard oscillating signal and a feed signal;

B. frequency divider means coupled to said oscillating signal for dividing said oscillating signal into a time signal having a lower frequency than said oscillating signal;

C. time display means connected to said time signal for displaying time information in response thereto;

D. at least one touch-sensitive key switch means for providing an activation signal in response to a human touch when coupled to said feed signal, said switch means being both stationary and contactless;

E. time correction means coupled to said frequency divider means for changing the time displayed by the watch in response to the activation signal;

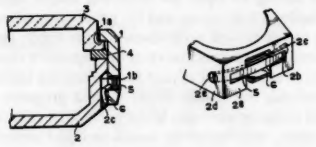
F. means for producing a control signal; and

G. gating means coupling said feed signal to said key switch means in response to the control signal

4,257,118
WATCH CASE

Kunihiko Futaba, Akishima; Toshikazu Shimazaki, Tokyo; Atsumi Osagawa, Machida, and Akira Hiraoka, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,216
Claims priority, application Japan, Jan. 24, 1978, 53-7075[U]
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—276 **5 Claims**

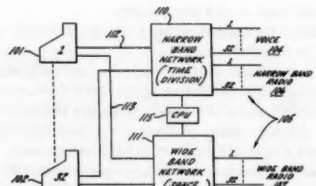


1. A watch case comprising:
a. an outer body having an inside wall;
b. an inner body having an outside wall;
c. a cover member;
d. a flexible packing ring sandwiched between the upper surface of said inner body and the lower surface of said cover member;
e. a horizontal groove formed on the outside wall of said inner body;
f. a spring having an internal side fitted to said horizontal groove;
g. a vertical groove formed on the outside wall of said inner body into which a lever is inserted;
h. a first hole provided at one end of said horizontal groove within which one end of said spring is enclosed;
i. a second hole provided at the opposite end of said horizontal groove within which the other end of said spring is enclosed; and
j. said lever supporting said spring in engagement with an elongate groove formed on said outer body, wherein said first and second holes are enclosed openings formed in the inner body, the holes permitting the spring to be inserted therein during assembly.

4,257,119
PCM SWITCHING SYSTEM FOR WIDE AND NARROW BAND SIGNALS

Satyan G. Pitroda, Villa Park, Ill., assignor to Wescom Switching, Inc., Oak Brook, Ill.

Filed Dec. 29, 1978, Ser. No. 974,304
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—58 **19 Claims**

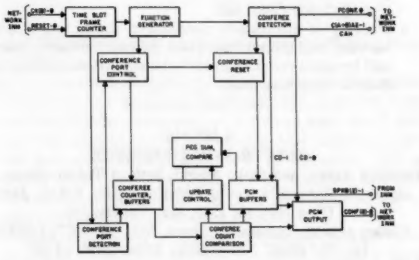


1. A telecommunications switching system comprising in combination, a plurality of wide band ports and a plurality of narrow band ports, a common control for controlling the functions of said system and including central processor means for producing connection commands for making connections between the ports, a hybrid digital network including time division means and space division means, the time division means including an information memory and a related connection memory having a plurality of memory locations associated with the respective narrow band ports for receiving and storing connection commands from the central processor means to effect connections between the narrow band ports, the space division means including space switching means and a related second connection memory having a plurality of memory locations associated with the respective wide band ports for receiving and storing connection commands from the central processor means to effect connections between the wide band ports, and means responsive to the connection commands stored in the respective connection memories for controlling the information memory and space switching means respectively to selectively make connections in the hybrid network.

4,257,120
MULTIPORT CONFERENCE CIRCUIT WITH MULTI-FRAME SUMMING

Tim Funderburk, Villa Park, and Donald W. McLaughlin, Naperville, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 6, 1979, Ser. No. 64,203
Int. Cl.³ H04M *3/56*
U.S. Cl. 370—62 **9 Claims**



1. In a pulse code modulated (PCM) communication system,
a plurality of communication channels arranged on a multiplexed basis,
a switching system including a memory, a memory access for said communication channels and a conference circuit arrangement including,
a first register connected to said memory and operated to store the pulse code modulated value of information from each of said channels conducted sequentially through said memory,
a second register connected to said first register and including an output circuit,
a conferee sum storage means including an output circuit,
binary adder means having a first input means connected to said first register and a second input means connected to said conferee sum storage means output circuit and operated to add said first and said second inputs to provide an output,
a third register connected to receive said output of said binary adder means and including an output circuit,
a first comparator circuit connected to said binary adder means and to said third register output circuit and operated to compare said outputs and in response to a determination that the value of information stored in said binary adder means is less than the value of information stored in said third register to provide a first output signal,
said third register operated in response to said first comparator circuit first output signal to store said binary adder means output,
first counting means connected to said memory and periodically incremented in response to signals from said memory,

a fourth register connected to said counting means and arranged to store the count of said counting means,

a fifth register connected to said fourth register,

a second comparator circuit connected to said counting means and fifth register and operated in response to a determination that the count stored in said counting means and fifth register are equal to provide an output signal,

a second counting means connected to said memory and operated to count the number of sequences of said memory to provide an output signal upon the passage of a predetermined number of sequences,

and means responsive to said second counting means output signal to operate said fifth register to accept the count stored in said fourth register,

a sixth register connected to the output of said second register and having an output to said switching system and operated in response to said signal from said second counting means for transfer of said pulse code modulated value of information from said second register to said channels under control of said switching system,

and gating control means connected to said first and second comparator circuits and selectively operated in response thereto to provide an update signal,

said update signal coupled to said conferee sum storage means to operate it to accept the pulse code modulated value of information from said binary adder means for storage therein, said update signal further being coupled to said fourth register to operate the latter to transfer the count in said counting means into storage in said fourth register.

4,257,121

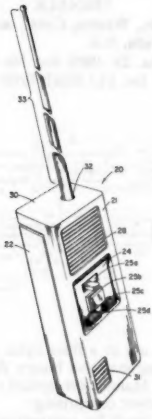
PORTABLE TRANSCEIVER

Claude L. Henderson, Camby, and Michael E. Shepperd, Indianapolis, both of Ind., assignors to General Aviation Electronics, Inc., Indianapolis, Ind.

Filed May 26, 1977, Ser. No. 909,822

Int. Cl.³ H04B *1/38*

U.S. Cl. 455—89 **14 Claims**



1. A portable transceiver for communication between a user location and at least one remote location, said transceiver comprising:

a transceiver housing having two side surface portions and two end surface portions configured into a generally rectangular shape and enclosed by comparatively larger, generally rectangular, front surface and rear surface portions;

a transceiver circuit located within said housing;

a control panel portion disposed within and recessed below said front surface portion; and

a plurality of operator controls communicating with said transceiver circuit and providing for the complete operation of said portable transceiver by the user, every control of said plurality of operator controls protruding through said control panel portion and positioned flush with to recessed below said front surface portion.

4,257,122

APPARATUS FOR IMPROVING THE EFFICIENCY OF THE MODULATION STAGE OF A TRANSMITTER

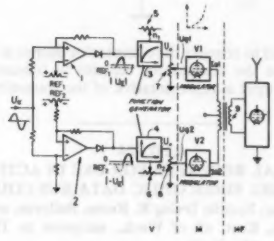
Ole Snedkerud, Windisch, Switzerland, assignor to Patelhold Patentverwertungs- & Elektro-Holding AG, Glarus, Switzerland

Filed Nov. 17, 1978, Ser. No. 961,697

Claims priority, application Switzerland, Nov. 29, 1977, 14576/77

Int. Cl.³ H04B *1/02*

U.S. Cl. 455—91 **8 Claims**



1. A transmitter comprising:

(A) a modulator circuit having a modulator tube for which the anode current I_a of said tube depends, at least within a predetermined range, upon the grid voltage U_g of said tube in accordance with the equation $I_a = k \cdot U_g^m$, k and m being constants;

(B) a deaccentuator means coupled to an input of said modulator circuit for causing said anode current I_a to vary in accordance with the equation $I_a = k[h(U_E)^n]^m$ where h and n are constants, U_E is the signal at the input to the deaccentuator and $n = 1/m$ so that $I_a = k \cdot h^m \cdot U_E$ is a linear function of U_E; and

(C) a high frequency stage for generating a high frequency carrier signal which is modulated by said anode current Ia;

(D) said deaccentuator means comprising:

(1) means for forming a logarithm of an input signal thereto;

(2) means for multiplying the logarithm thus formed by a factor n; and

(3) means for forming the antilogarithm of the multiplied logarithm.

4,257,123

DEVICE FOR MONITORING THE PERFORMANCE OF A TRANSMITTER

David R. Birt, Charlwood, and John A. Brandhuber, Brighton, both of England, assignors to Communications Patents Limited, London, England

Filed Apr. 24, 1979, Ser. No. 32,953

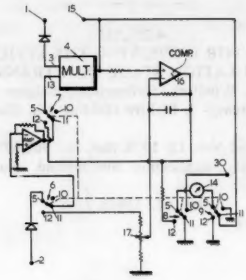
Claims priority, application United Kingdom, Apr. 27, 1978, 16673/78

Int. Cl.³ H04B *17/00*

U.S. Cl. 455—115 **5 Claims**

1. A device for monitoring the performance of a transmitter, comprising a first input for receiving a signal representative to transmitter output current, a second input for receiving a signal representative of transmitter output voltage, a multiplier, a comparator connected to the output of the multiplier, and

switching means controllable either to connect the first and second inputs to the multiplier such that the multiplier output is representative of the transmitter output power, or to connect one of the two inputs to the multiplier and the other to the



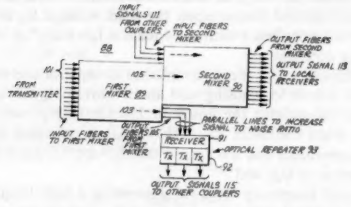
comparator and to connect the comparator output to the multiplier such that the comparator remains in balance and the comparator output is representative of the transmitter output impedance.

4,257,124

OPTICAL REPEATER FOR USE IN ACTIVE MULTIPORT FIBER OPTIC DATA BUS COUPLER

David R. Porter, Seattle; Irving R. Reese, Bellevue, and Greg J. Von Bokern, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 2, 1979, Ser. No. 26,376
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—601 **4 Claims**


INPUT SIGNALS 111 FROM OTHER COUPLERS
INPUT FIBERS TO SECOND MIXER
OUTPUT FIBERS FROM SECOND MIXER
OUTPUT SIGNAL 113 TO LOCAL RECEIVERS
FROM TRANSMITTER
FIRST MIXER 89
SECOND MIXER 95
PARALLEL LINES TO INCREASE SIGNAL TO NOISE RATIO
INPUT FIBERS TO FIRST MIXER
OUTPUT FIBERS FROM FIRST MIXER
RECEIVER 91
OPTICAL REPEATER 93
OUTPUT SIGNALS 115 TO OTHER COUPLERS

1. An optical repeater for use in an active multiport fiber optic data bus coupler, said optical repeater comprising:

a receiver circuit including means responsive to a plurality of identical optical signals coupled through photodetector means to a cascode amplifier circuit;

a transmitter circuit; and

a discriminator circuit coupled between said receiver circuit and said transmitter circuit.

4,257,125

RECEIVER FOR UNIPOLAR MANCHESTER FIBER OPTICS SIGNALS

Charles E. Theall, Jr., Weston, Conn., assignor to The Singer Company, Little Falls, N.J.

Filed May 1, 1979, Ser. No. 35,119
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—608 **9 Claims**

1. A receiver for use in a fiber optic data communication system for recovering multi-bit binary digital messages from unipolar trapezoidal Manchester optical signals transmitted in the system, said receiver including:

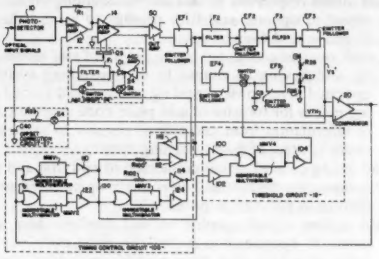
a photo-detector circuit for converting the received optical signals into a range of unipolar electrical signals;

an amplifier circuit direct-current coupled to the photo-detector circuit for amplifying the unipolar electric signals in said range;

a comparator coupled to the output of the amplifier for converting the amplified unipolar signals into bipolar signals; and

a threshold circuit coupled to the output of the amplifier circuit and to the comparator for establishing a switching point for the comparator at the mid-amplitude level of the received optical signals, and in which

said amplifier circuit includes a direct current coupled pre-amplifier and post-amplifier, said pre-amplifier performing wide-band conversion of the output currents within said range from the photo-detector circuit into input signal voltages within said range for the post-amplifier, and the



post-amplifier amplifying the signal voltages within said range to the level required for comparison by said comparator, and which includes

a bandpass filter interposed between the output of said post-amplifier and the input of the comparator for decreasing the root-mean-square noise voltage in the amplified signals, and which includes

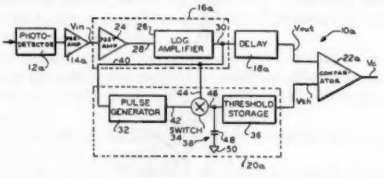
an offset correction circuit connected to the output of said filter circuit and to the input of said pre-amplifier for providing offset correction voltages to the base line of the signals translated by the amplifier circuit.

4,257,126

LOGARITHMIC RECEIVER FOR FIBER OPTIC SIGNALS

Charles E. Theall, Jr., Weston, Conn., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 28, 1980, Ser. No. 116,072
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—619 **10 Claims**



1. A receiver for use in a fiber optic data communication system for recovering multi-bit binary digital messages from unipolar trapezoidal Manchester optical signals transmitted in the system, said receiver comprising:

a photo-detector circuit for converting the received optical signals into a range of unipolar electrical signals;

a logarithmic amplifier circuit coupled to the photo-detector circuit for converting the unipolar electric signals into a range of logarithmic unipolar signals;

a comparator coupled to an output of the logarithmic amplifier circuit for converting the logarithmic unipolar signals into bipolar signals; and

a logarithmic threshold circuit coupled to the logarithmic amplifier circuit and coupled to the input of the comparator for providing logarithmic threshold signals to the comparator for establishing a switching point for the comparator at the mid-amplitude level of the received optical signals.

DESIGN PATENTS

GRANTED MAR. 17, 1981

ERRATA

For CLASS	See PATENT NO.
D21–076	258,582

258,545
SKATE BOOT OR THE LIKE
Philip V. Chiarella, Hampstead, Canada, assignor to Les Produits Sportifs Micron Inc. - Micron Sports Products Inc., Montreal, Canada
Filed Feb. 28, 1978, Ser. No. 882,970
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275

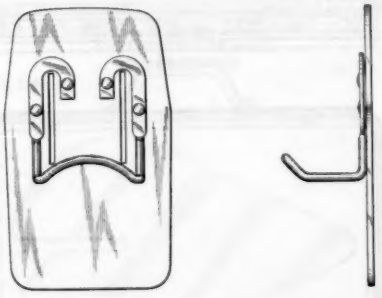
258,546
SHOE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc.
Filed Jul. 28, 1978, Ser. No. 928,989
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

258,547
SHOE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc.
Filed Jul. 28, 1978, Ser. No. 928,990
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

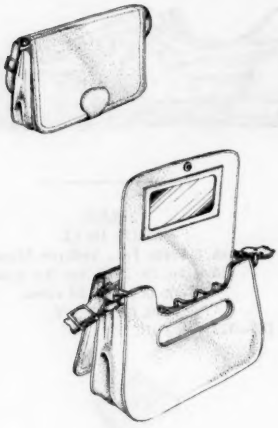
258,548
SHOE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc.
Filed Jul. 28, 1978, Ser. No. 928,991
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

258,549
SHOE HEEL
Paul R. Goldman, 8 Joyce Ter., Andover, Mass. 01810
Filed Jan. 25, 1979, Ser. No. 6,443
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323

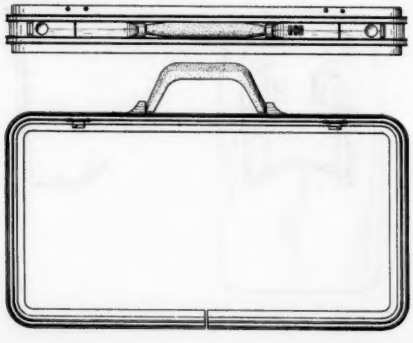
258,550
HAMMER HOLDER
Joel S. Strauss, 11 Wooded La., Randolph, N.J. 07801
Filed Jun. 19, 1978, Ser. No. 916,572
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



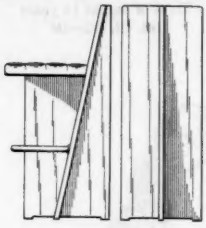
258,551
HANDBAG
Milton I. Siegel, Martinsville, N.J., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed May 15, 1978, Ser. No. 906,142
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52



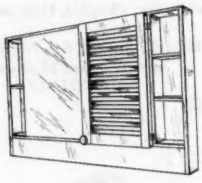
258,552
COMBINED VALANCE, LOCK AND HANDLE ASSEMBLY FOR LUGGAGE OR THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc.
Filed Oct. 10, 1978, Ser. No. 950,219
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—76



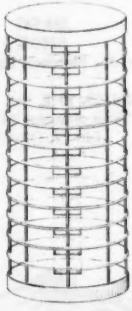
258,553
BAR STOOL
Robert W. Nuss, 205 N. Haddonfield Apts., Westmont, N.J. 08108
Filed Nov. 1, 1978, Ser. No. 956,635
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32



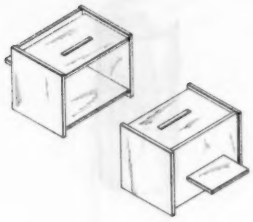
258,554
BATHROOM CABINET
Lars M. Andersson, Halmstad, Sweden, assignor to HAFA Fabriks AB, Halmstad, Sweden
Filed Nov. 29, 1978, Ser. No. 964,586
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—104



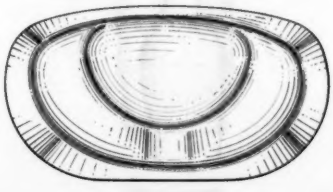
258,555
ROTATABLE MERCHANDISE DISPLAY STAND
Stanley H. Rosenthal, Rt. 2, Box 713, Air Harbor Rd., Greensboro, N.C. 27405
Filed Feb. 12, 1979, Ser. No. 11,223
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—146



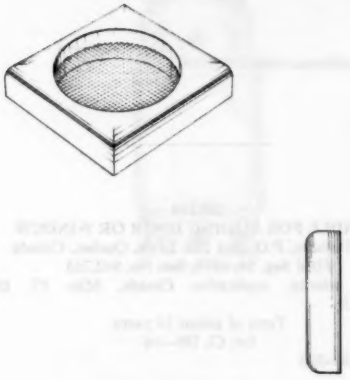
258,556
SUPPORT TABLE FOR PRINTER
Joseph T. Verdesca, 5604 Lobello Dr., Dallas, Tex. 75229
Filed Jul. 17, 1978, Ser. No. 925,322
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—179



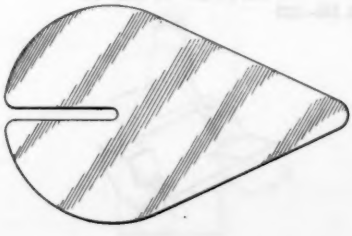
258,557
ANATOMICALLY CORRECT HEAD SUPPORT
Nicholas G. Herr, Burbank, Calif., assignor to Xenika, Inc., Los Angeles, Calif.
Filed May 24, 1979, Ser. No. 42,271
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



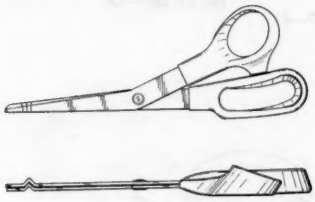
258,558
FLOUR SIFTER OR THE LIKE
Mark H. Freedman, 432 Marzano, Albuquerque, N. Mex. 87106, assignor to Mark H. Freedman and Theodore M. Freedman, d.b.a. Screenz Products, both of Albuquerque, N. Mex.
Filed Jun. 30, 1978, Ser. No. 920,858
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47



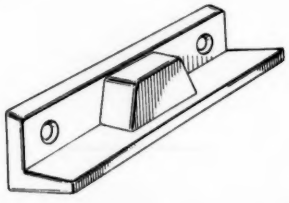
258,559
TOOL USED IN TRANSPLANTING POTTED PLANTS
Charles F. Viel, III, 409 Garland Rd., Wilmington, Del. 19803
Filed Jul. 1, 1978, Ser. No. 939,191
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—1



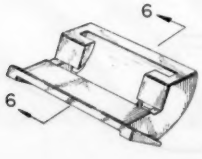
258,560
PATTERN CUTTING SCISSORS WITH NOTCHED BLADES
Elizabeth E. Stout, 267 Dearborn N. Salem, Oreg. 97303
Filed Jun. 16, 1978, Ser. No. 916,791
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57



258,561
HANDLE FOR SLIDING DOOR OR WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,753
Claims priority, application Canada, Mar. 17, 1978, 17-03-78-13
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—300



258,562
REMOVABLE HINGE RETAINER FOR VEHICLE SUN ROOFS
George E. DeStepheno, San Dimas, Calif., assignor to Le Van Specialty Co., Inc., City of Industry, Calif.
Filed Sep. 14, 1978, Ser. No. 942,299
Term of patent 14 years
Int. Cl. D8—*06*; D12—*16*
U.S. Cl. D8—323



258,563
CONTAINER FOR LIQUIDS
G. Franco Romagnoli, 37 Garfield St., Watertown, Mass. 02172
Filed Jun. 29, 1978, Ser. No. 920,293
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

258,564
BOTTLE OR SIMILAR ARTICLE
Thomas H. Hayes, Baton Rouge, La., assignor to Ethyl Corporation, Va.
Filed Apr. 30, 1979, Ser. No. 34,624
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—383

258,565
DISPENSING CONTAINER FOR LIQUID ADHESIVE OR THE LIKE
Tomozo Sekiguchi, Soka, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1978, Ser. No. 869,382
Claims priority, application Japan, Jul. 13, 1977, 52-27681
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—338

258,566
JAR OR SIMILAR ARTICLE
Jerald E. Potter, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Dec. 14, 1978, Ser. No. 969,562
Term of patent 14 years
Int. Cl. D9—*01*; D7—*01*
U.S. Cl. D9—385

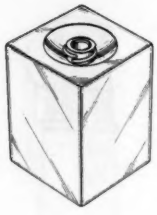
258,567
JAR OR SIMILAR ARTICLE
David M. O'Toole, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Dec. 14, 1978, Ser. No. 969,563
Term of patent 14 years
Int. Cl. D09—*01*; D07—*01*
U.S. Cl. D9—385

258,568
BOTTLE OR SIMILAR ARTICLE
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Co., Stamford, Conn.
Filed Feb. 1, 1979, Ser. No. 8,643
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—412

258,569
BOTTLE AND CAP OR SIMILAR ARTICLE
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Co., Stamford, Conn.
Filed Feb. 1, 1979, Ser. No. 8,646
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—377

258,570
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Dec. 14, 1978, Ser. No. 969,564
Term of patent 14 years
Int. Cl. D9—*01*; D7—*01*
U.S. Cl. D9—385

258,571
BOTTLE
Clayton N. Hirtle, 44332 Balch Park Dr., Springville, Calif. 93265
Filed Apr. 3, 1980, Ser. No. 136,808
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—401



258,572
PACKAGE OF HANDKERCHIEFS
Will Kaplan, New York, N.Y., assignor to Dumont Handkerchiefs, Inc., New York, N.Y.
Filed Nov. 13, 1978, Ser. No. 959,488
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—307

258,573

DISPLAY CONTAINER FOR TOYS OR SIMILAR ARTICLE

Seiko Konya, Monterey Park; Janice E. Rosenthal, Manhattan Beach; Virginia R. Sargent, Hermosa Beach, and Robert F. Schroeder, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 5, 1979, Ser. No. 17,220
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—315

258,574

CARTON

Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Co., Stamford, Conn.

Filed Sep. 21, 1978, Ser. No. 945,651
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

258,575

DIAPHRAGM CASE OR THE LIKE

Wayne J. Stettler, Philadelphia, Pa., assignor to Paula Seibel, New York, N.Y.

Filed Jun. 20, 1979, Ser. No. 50,344
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D9—420

258,576

CLOSURE OR SIMILAR ARTICLE

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

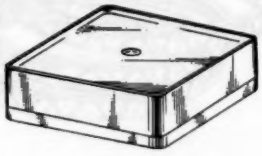
Division of Ser. No. 851,652, Nov. 15, 1977, which is a division of Ser. No. 675,404, Apr. 9, 1976, Pat. No. Des. 249,643, which is a continuation-in-part of Ser. No. 588,122, Jun. 18, 1975, abandoned. This application May 11, 1979, Ser. No. 39,041
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—452

258,577

SIGNALLING DEVICE

Alfred I. Bottner, Natick, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 4, 1978, Ser. No. 965,757
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106

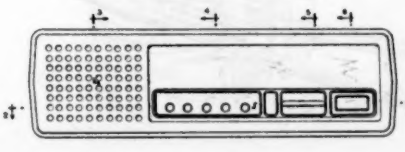


258,578

CONTROL PANEL FOR COMBINATION BURGLAR AND FIRE ALARM UNIT

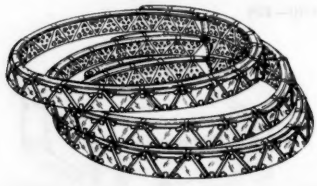
Masao Tsuji, North Plainfield, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,033
Term of patent 14 years
Int. Cl. D10—*05*; D13—*03*
U.S. Cl. D10—121

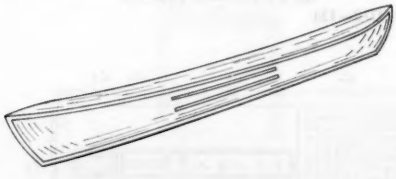


258,579
BRACELET
Pepi Kelman, 19264 Pacific Coast Hwy., Malibu, Calif. 90265
Filed Jun. 11, 1979, Ser. No. 47,023
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

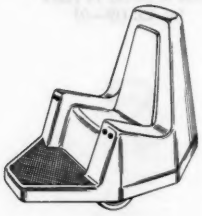
258,580
NECKLACE
Marina Bulgari, Nafpaktos, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed May 8, 1979, Ser. No. 37,125
Claims priority, application Italy, Nov. 15, 1978, 36169; Switzerland, Nov. 20, 1978, 110152; United Kingdom, Nov. 24, 1978, 987426/78; France, Nov. 28, 1978, 78 77066
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—5



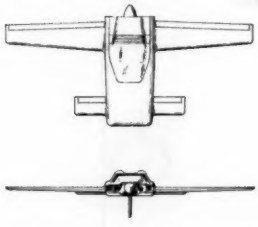
258,581
BOAT
Sobhi J. Abboud, 243 Marnell Ave., Santa Cruz, Calif. 95062
Filed Jan. 11, 1979, Ser. No. 2,662
Term of patent 7 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



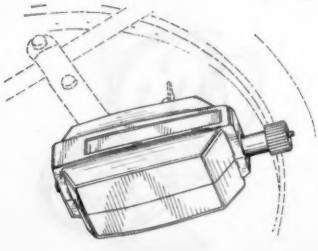
258,582
RIDING TOY
Charles W. Lanusse, P.O. Box 289, Opelousas, La. 70570
Filed Feb. 22, 1979, Ser. No. 14,147
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76



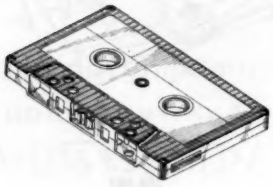
258,583
AIRPLANE
Gerald L. Jonas, 2217 Pacific Ave., #4, San Francisco, Calif. 94115
Filed Jul. 28, 1978, Ser. No. 929,112
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78



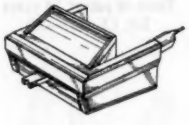
258,584
BICYCLE ELECTRICAL GENERATING SYSTEM
Leron R. Thomas, North Canton, Ohio, assignor to Ervin Wilkof, Canton, Ohio
Filed Jul. 27, 1978, Ser. No. 929,764
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—02

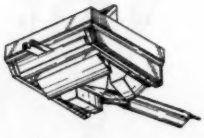


258,585
MAGNETIC HEAD ERASER
Keiichi Yoshizawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd.
Filed Jul. 5, 1978, Ser. No. 922,092
Claims priority, application Japan, Feb. 6, 1978, 53-358119
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11

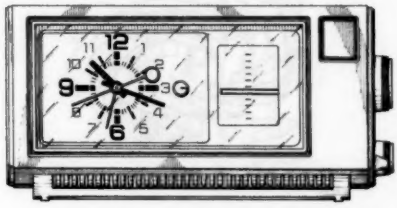


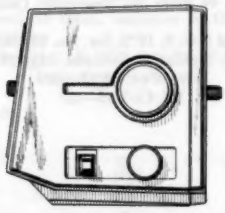
258,586
PHONOGRAPH STYLUS
Joseph D. Kehl, Chicago, and Robert L. Deschamps, Wheaton, both of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.
Filed Jul. 31, 1978, Ser. No. 929,552
Term of patent 14 years
Int. Cl. 14—*01, 99*
U.S. Cl. D14—29



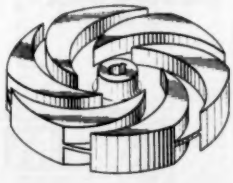


258,587
CLOCK RADIO OR SIMILAR ARTICLE
John S. Kolwaite, Dewitt, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Feb. 7, 1979, Ser. No. 10,270
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73

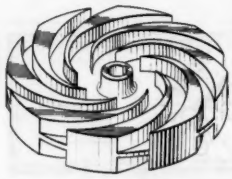




258,588
IMPELLER FOR CENTRIFUGAL PUMPS OR SIMILAR ARTICLE
Eiichi Sugiura, 149, Matsumotocho, Hekinan-shi, Aichi-ken, Japan
Filed Mar. 22, 1978, Ser. No. 889,057
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

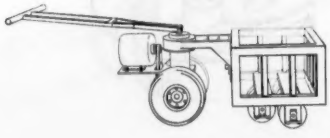


258,589
IMPELLER FOR CENTRIFUGAL PUMPS OR SIMILAR ARTICLE
Eiichi Sugiura, 149, Matsumotocho, Hekinan-shi, Aichi-ken, Japan
Filed Mar. 22, 1978, Ser. No. 889,120
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

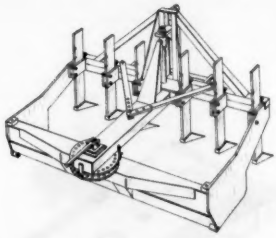


258,590
PUMP
Ronald K. Shaw, 44 Mary St., Noosaville, Queensland, 4566, Australia
Filed Nov. 9, 1978, Ser. No. 959,385
Claims priority, application Australia, May 29, 1978, 74889
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

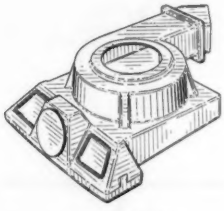
258,591
WEIGHT APPLYING MACHINE FOR INSTALLING A VENEER FLOOR SURFACE
Frank K. Wyckoff, Des Moines, and Roger C. Silver, West Des Moines, both of Iowa, assignors to Atlas Products, Inc., Des Moines, Iowa
Filed Sep. 18, 1978, Ser. No. 943,172
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—20



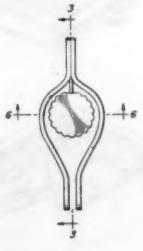
258,592
EARTH WORKING IMPLEMENT
John P. Staley, 6080 Ingold Rd., Whitsett, N.C. 27377
Filed Jul. 31, 1978, Ser. No. 929,450
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



258,593
HOUSING FOR SUCTION SWEEPER
Robert M. Rubin, Kansas City, Mo., assignor to Billy Goat Industries, Inc., Lee's Summit, Mo.
Filed Dec. 15, 1978, Ser. No. 969,735
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53



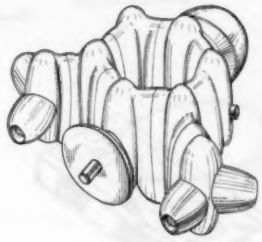
258,594
TUNING FORK
Andrew M. Wohlert, St. Charles, Ill., assignor to Knab, Inc., Geneva, Ill.
Filed Jan. 22, 1979, Ser. No. 5,155
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D17—99



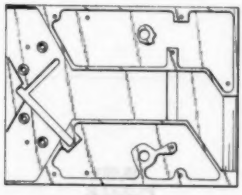
258,595
FONT OF TYPE
Kathryn S. Green, Burlingame, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 28, 1978, Ser. No. 937,675
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—24

258,596
FOUNTAIN PEN
Luigi Massoni, and Dino Pelizza, both of Cermenate, Italy, assignors to Nazareno Gabrielli S.p.A., Italy
Filed Jan. 3, 1978, Ser. No. 866,230
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

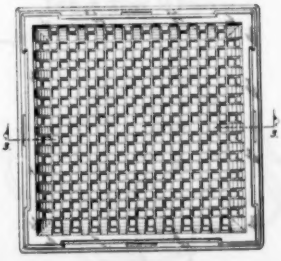
258,597
MOLECULAR MODEL
Edward J. Barrett, 1725 York Ave., New York, N.Y. 10028
Filed Aug. 26, 1977, Ser. No. 828,156
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



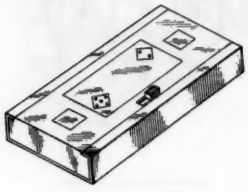
258,598
COIN CHUTE
Rex M. Maloy, Broken Arrow, and C. David Coburn, Muskogee, both of Okla., assignors to Orin W. Coburn, Muskogee, Okla.
Filed May 10, 1979, Ser. No. 37,813
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—9



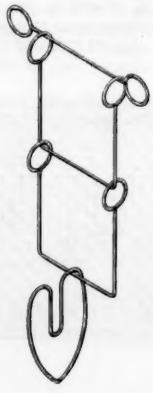
258,599
GAME BOARD OR SIMILAR ARTICLE
Henry T. Hodges, Torrance; Robert W. Nall, Hawthorne, and William F. Sestito, Lakewood, all of Calif., assignors to Mattell, Inc., Hawthorne, Calif.
Filed Mar. 5, 1979, Ser. No. 17,295
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17



258,600
CASING FOR AN ELECTRONIC DICE GAME OR THE LIKE
Evelyn G. Case, 1308 Walnut St., Webster City, Iowa 50595
Filed Aug. 21, 1978, Ser. No. 935,728
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41

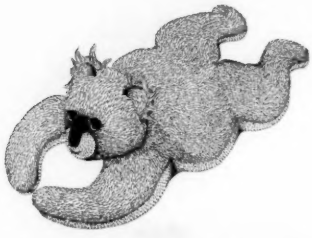


258,601
PUZZLE
James Smallwood, Jr., 5072 Xandu, Denver, Colo. 80239
Filed Oct. 25, 1977, Ser. No. 844,703
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—106



258,602
MOUNTAIN LION FIGURE
Patricia I. Holstine, 16 N. Main, Conrad, Mont. 59425
Filed Apr. 11, 1979, Ser. No. 29,144
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—148

258,603
KOALA BEAR FIGURE
Patricia I. Holstine, 16 N. Main, Conrad, Mont. 59425
Filed Apr. 11, 1979, Ser. No. 29,143
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—159

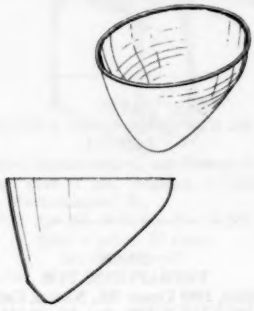


258,604
ICE SKATE BLADE GUARD
Daniel Sholl, 18331 Erwin St., Reseda, Calif. 91335
Filed Oct. 5, 1978, Ser. No. 948,932
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225

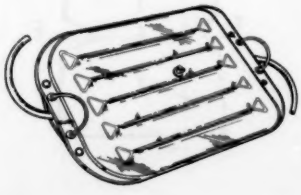
258,605
ROLLER SKATE
Glen D. Sanders, 1372 Sierra Alta Dr., Tustin, Calif. 92680
Filed Feb. 9, 1979, Ser. No. 10,729
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

258,606
BASKET FOR A SKI POLE OR SIMILAR ARTICLE
Trygve Evjen; Bjorn Gulbrandsen, both of Oslo; Magne Halvorsen, Lillehammer, and Bjorn E. Sandsten, Oslo, all of Norway, assignors to Trygve Liljedahl Skistavfabrikk A/S, Lillehammer, Norway
Filed Mar. 13, 1978, Ser. No. 886,084
Claims priority, application Sweden, Sep. 13, 1977, 771827
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

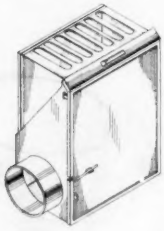
258,607
BOWL FOR SANITARY FITTINGS
Gordon M. Wilson, Tring, England, assignor to W. & G. Sisson Limited, Sheffield, England
Filed Apr. 28, 1978, Ser. No. 901,263
Claims priority, application United Kingdom, Nov. 25, 1977, 982400/77
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67



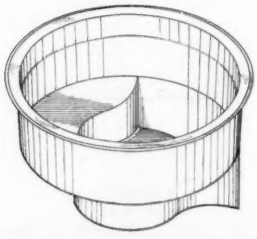
258,608
SOLAR WATER HEATER
Barend J. du Plooy, Bellville, South Africa, assignor to Shell South Africa (Proprietary) Ltd., Cape Town, South Africa
Filed Dec. 18, 1978, Ser. No. 969,951
Claims priority, application South Africa, Aug. 11, 1978, 78/1104
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—86



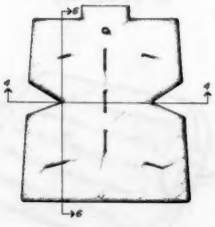
258,609
CLOTHES DRYER VENT VALVE AND FILTER HOUSING
Eugene W. Vogt, Gunnison, Colo., assignor to Seventy Seven Ltd., Gunnison, Colo.
Filed Jul. 20, 1978, Ser. No. 926,912
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



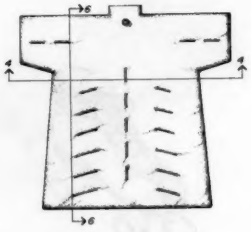
258,610
THERAPEUTIC TUB
Victor J. Tulipani, 2495 Center Rd., Novato, Calif. 94947
Filed Apr. 2, 1979, Ser. No. 26,133
Term of patent 14 years
Int. Cl. 24—*01;* 23—*02*
U.S. Cl. D24—38



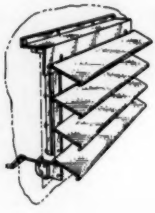
258,611
VACUUM SPLINT
Peter Baturin, Winnipeg, Canada, assignor to Medical Products Institute Incorporated, Winnipeg, Canada
Filed Oct. 10, 1978, Ser. No. 949,905
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



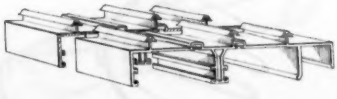
258,612
VACUUM SPLINT
Peter Baturin, Winnipeg, Canada, assignor to Medical Products Institute Incorporated, Winnipeg, Canada
Filed Oct. 10, 1978, Ser. No. 949,906
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



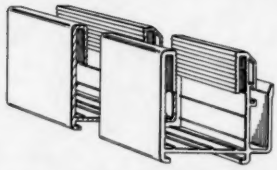
258,613
LOW PROFILE WINDOW AWNING
Harry McReynolds, 27395 Airstream Way, Sun City, Calif. 92381
Filed Jan. 8, 1979, Ser. No. 1,451
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—52



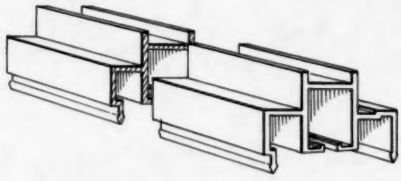
258,614
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,436
Claims priority, application Canada, Mar. 17, 1978, 1703786
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



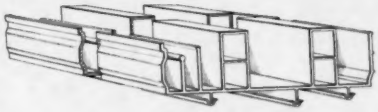
258,615
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,437
Claims priority, application Canada, Mar. 17, 1978, 1703787
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



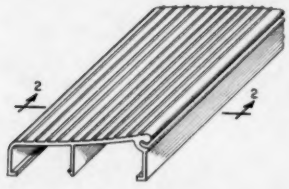
258,616
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,438
Claims priority, application Canada, Mar. 17, 1978, 1703788
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



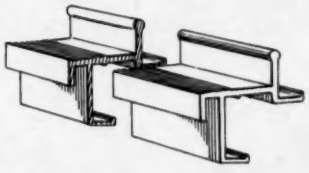
258,617
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,439
Claims priority, application Canada, Mar. 17, 1978, 1703789
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



258,618
SWIMMING POOL COPING MEMBER OR SIMILAR ARTICLE
James T. Cribben, Mechanicsburg, and Richard A. Feeser, Mt. Holly Springs, both of Pa., assignors to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Apr. 30, 1979, Ser. No. 34,568
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—74



258,619
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Sep. 14, 1978, Ser. No. 942,755
Claims priority, application Canada, Mar. 17, 1978, 17037810
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF MARCH, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Tuschhoff, John V.; Eastman, James E.; and Schanefelt Robert V., 4,256,509, Cl. 127-32.000.

A. W. Chesterton Company: *See*—
Kozlowski, Peter F., 4,256,011, Cl. 87-6.000.

AB Asea-Atom: *See*—
Berglund, Ake; and Fries, Ake, 4,256,314, Cl. 277-27.000.

AB Eiser: *See*—
Klingspor, Bengt G. E., 4,255,819, Cl. 2-239.000.

AB Mahler & Soner: *See*—
Mahler, Oscar; and Furberg, Lars, 4,255,878, Cl. 37-42.0VL.

AB Wicanders Korkfabriker: *See*—
Harding, Sune, 4,256,233, Cl. 215-254.000.

Abbott Laboratories: *See*—
Leahey, John J.; Muetterties, Andrew J.; and Genese, Joseph N., 4,256,105, Cl. 128-214.00G.
Muetterties, Andrew J.; and Genese, Joseph N., 4,256,104, Cl. 128-214.00G.

Abe, Kuniomi: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,256,384, Cl. 351-7.000.

Abe, Michio, to Tokai TRW & Co. Ltd. Structure for mounting ball joint. 4,256,413, Cl. 403-282.000.

Abels, Theodor; and Gotz, Bernhard. Pedal control for vehicle having a continuously adjustable transmission. 4,255,984, Cl. 74-474.000.

Abramo, John V.: *See*—
Partain, Larry D.; and Lakshminarayana, Mysore R., 4,257,001, Cl. 324-58.50C.

Abramo, Samuel V.: *See*—
Partain, Larry D.; and Lakshminarayana, Mysore R., 4,257,001, Cl. 324-58.50C.

Access Control Systems Pty. Ltd.: *See*—
Hopkinson, Dennis, 4,256,956, Cl. 235-449.000.

ACF Industries, Incorporated: *See*—
Compton, Donald R., 4,256,020, Cl. 92-102.000.

Achard, Georges; Anouilh, Gilbert; Chion, Pierre; and Vincent, Roger, to Rhone-Poulenc Textile. High-shrinkage acrylic fibers and the process for their production. 4,256,684, Cl. 264-168.000.

Acme Visible Records, Inc.: *See*—
Lapp, James F.; and McGrath, Thomas F., 4,256,248, Cl. 226-118.000.

Actionair Equipment Limited: *See*—
Magill, Robert J.; and Field, Sydney J., 4,256,143, Cl. 137-601.000.

Acurex Corporation: *See*—
Vindum, Jorgen O., 4,256,088, Cl. 126-418.000.

Acushnet Company: *See*—
Porter, Raymond P., 4,256,683, Cl. 264-157.000.

Adams, Jack W.: *See*—
Helms, William E.; and Adams, Jack W., 4,257,002, Cl. 324-66.000.

Ader, Gary B.: *See*—
McMickle, Robert L.; Ader, Gary B.; and Grice, Steven L., 4,255,880, Cl. 37-43.00B.

Adlerborn, Jan; Larker, Hans; and Nilsson, Jan, to ASEA Aktiebolag. Method for manufacturing an object of silicon nitride. 4,256,688, Cl. 264-325.000.

Adolphi, Heinrich: *See*—
Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, 4,256,754, Cl. 424-269.000.

AEG-Elotherm GmbH: *See*—
von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, 4,256,165, Cl. 164-147.000.

Aerco International, Inc.: *See*—
Cohen, Kenneth W., 4,256,176, Cl. 165-76.000.

Aerotrans Rohrpostanlagen Gesellschaft m.b.H.: *See*—
Stangl, Wilfried, 4,256,418, Cl. 406-112.000.

Agcaoili, Clarito R., to Efron, Incorporated. Slidable door structure. 4,256,164, Cl. 160-186.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Serruys, Max Y. A. M., 4,256,066, Cl. 123-545.000.

AGFA-Gevaert, A.G.: *See*—
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., 4,256,830, Cl. 430-372.000.
Stemme, Otto; and Staudacher, Frank, 4,256,392, Cl. 354-86.000.

Ahern, Douglas K., to Eastman Kodak Company. Self-compensating registration mechanism. 4,256,298, Cl. 271-245.000.

Aibe, Toshio: *See*—
Nishino, Hiroshi; Aibe, Toshio; and Ogino, Fumiichi, 4,256,728, Cl. 422-4.000.

Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for mixing gases and apparatus used therefor. 4,256,604, Cl. 252-188.30R.

Aigner, Hansjorg; Behmel, Klaus; and Luttenberger, Johann, to Vianova Kunstharz, A.G. Use of low molecular weight oxazolines as neutralizing agents for anionic water-dilutable resins. 4,256,620, Cl. 260-29.6HN.

Air Products and Chemicals, Inc.: *See*—
Dyer, Paul N., 4,256,649, Cl. 260-348.330.

Ajinomoto Company, Limited: *See*—
Takayanagi, Yoshikazu; Iizumi, Katsuo; Miyazawa, Masashi; Yamaya, Nobuyuki; and Tamura, Hajime, 4,256,917, Cl. 562-562.000.

Akebono Brake Industry Company, Ltd: *See*—
Maehara, Toshifumi, 4,256,206, Cl. 188-71.900.
Nishiwaki, Takeshi, 4,256,253, Cl. 228-112.000.

Akimoto, Hiroshi: *See*—
Miyashita, Osamu; and Akimoto, Hiroshi, 4,256,746, Cl. 424-248.540.

Akutsu, Masao: *See*—
Suzuki, Sadao; Akutsu, Masao; and Ota, Akiho, 4,256,789, Cl. 428-35.000.

Akzo N.V.: *See*—
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van Andel, Eleonoor, 4,256,719, Cl. 423-424.000.

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de Wied, David; and Greven, Hendrik M., 4,256,736, Cl. 424-177.000.
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Graninger, Frank J., 4,256,021, Cl. 92-143.000.

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Gilman, John J., 4,256,039, Cl. 102-52.000.
Mathew, Chempolil T.; and Pickens, Donald, 4,256,668, Cl. 564-255.000.
Thomas, Rudy V., 4,256,328, Cl. 280-802.000.

Allied Colloids Limited: *See*—
Flesher, Peter; and Johnson, Ian M., 4,256,660, Cl. 260-513.00N.

Allison, Blaine H.: *See*—
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Dawless, Robert K., 4,256,717, Cl. 423-348.000.
Peirson, Robert C.; Vanada, James R.; and Donatelli, Paul C., 4,257,093, Cl. 364-105.000.

Alza Corporation: *See*—
Theeuwes, Felix, 4,256,108, Cl. 128-260.000.

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Sauerwein, Lewis E.; and Gross, Richard L., 4,256,036, Cl. 101-45.000.

Amberg, Stephen W., to Owens-Illinois, Inc. Method and apparatus for making plastic preforms for packaging containers. 4,256,028, Cl. 493-287.000.

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Meyers, George L., 4,256,256, Cl. 229-56.000.

Pawlowski, Thomas D., 4,256,223, Cl. 206-45.110.
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Choksi, Pradip V.; Christoffel, William D.; and Edwards, Christopher J. C., 4,255,996, Cl. 83-140.000.
Crowley, Donald J.; and McLaughlin, Jimmy E., 4,255,818, Cl. 2-51.000.
Jones, Eugene C., 4,256,333, Cl. 285-22.000.
American Standard Inc.: *See*—
Ruff, Robert O., 4,255,902, Cl. 49-488.000.
American Technology, Inc.: *See*—
Bilitch, Michael, 4,256,115, Cl. 128-419.00P.
AMF Incorporated: *See*—
Greider, Charles A., 4,255,879, Cl. 37-43.00R.
Jung, Wilhelm H., 4,256,048, Cl. 112-292.000.
Ammann, Hans H.; and Oien, Michael A., to Bell Teiephone Laboratories, Incorporated. Flexible circuit reflow soldering machine. 4,256,512, Cl. 134-64.00R.
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Tominoi, Kinitada, 4,255,850, Cl. 29-742.000.
Ampco Foods Inc.: *See*—
Weaver, William D.; and Simon, Warren J., 4,256,777, Cl. 426-637.000.
AMSTED Industries Incorporated: *See*—
Kemper, James M.; and Tilly, Lynn K., 4,256,041, Cl. 105-197.0DB.
Kozar, Robert S., 4,256,578, Cl. 210-766.000.
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Somasundaran, Ponisseril; and Ananthapadmanabhan, Kavssery P., 4,256,571, Cl. 209-5.000.
Ancra Corporation: *See*—
Knox, Howard T.; and McAtee, James E., 4,256,424, Cl. 410-105.000.
Anderson, Glenn R., to Minnesota Mining and Manufacturing Company. Magnetic pickup subassembly. 4,256,986, Cl. 310-155.000.
Anderson, Wayne M.: *See*—
Hang, Kenneth W.; and Anderson, Wayne M., 4,256,796, Cl. 428-210.000.
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Cheung, Derek T.; Andrews, A. Mike, II; and Longo, Joseph T., 4,257,057, Cl. 357-24.000.
Anouilh, Gilbert: *See*—
Achard, Georges; Anouilh, Gilbert; Chion, Pierre; and Vincent, Roger, 4,256,684, Cl. 264-168.000.
Anton, Leonard M.: *See*—
Egner, Elmer A., 4,256,295, Cl. 269-45.000.
Antonitsch, Sepp: *See*—
Sauer, Hans; Steinbichler, Wolf; Ritter, Heinz; and Antonitsch, Sepp, 4,257,081, Cl. 361-156.000.
Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,256,566, Cl. 208-139.000.
Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,256,608, Cl. 252-441.000.
Aoki, Keiji: *See*—
Nakatomi, Takayoshi; and Aoki, Keiji, 4,256,072, Cl. 123-415.000.
Appelt, Daren R., to Texas Instruments Incorporated. Communication bus coupler. 4,257,099, Cl. 364-200.000.
Arakawa, Tamio: *See*—
Inata, Hiroo; Arakawa, Tamio; and Nishihara, Toshio, 4,256,558, Cl. 204-159.150.
Argus Chemical Corporation: *See*—
Brecker, Lawrence R.; and Keeley, Charles, 4,256,618, Cl. 260-23.0XA.
Ariel, Gideon B.: *See*—
Keiser, Dennis L.; and Ariel, Gideon B., 4,256,302, Cl. 272-118.000.
Arnold, William A. Universal mechanical seal gland. 4,256,313, Cl. 277-11.000.
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Arora, Gulshan K., to Wallace-Murray Corporation. Floating ring bearing structure and turbocharger employing same. 4,256,441, Cl. 417-407.000.
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Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, 4,256,645, Cl. 260-343.500.
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Haraguchi, Keisuke; and Nakamura, Susao, 4,256,394, Cl. 354-173.000.
Asai, Akiji: *See*—
Thies, Peter Willibrord; and Asai, Akiji, 4,256,642, Cl. 260-340.300.
Asai, Kiyokazu: *See*—
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Asano, Kazuhiro; and Sasaki, Seiko, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,257,116, Cl. 368-69.000.
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Asbach, Dietrich: *See*—
Lindemann, Eckhard; Broning, Jorg; and Asbach, Dietrich, 4,257,042, Cl. 340-716.000.
ASEA Aktiebolag: *See*—
Adlerborn, Jan; Larker, Hans; and Nilsson, Jan, 4,256,688, Cl. 264-325.000.
Bachler, Sven, 4,256,941, Cl. 200-153.0SC.
Hareland, Ingvar, 4,257,025, Cl. 336-84.00M.
Ashman, Leland E., to Ceres Corporation. Method and means of rapidly distinguishing a simulated diamond from natural diamond. 4,255,962, Cl. 73-15.00A.
Ashworth, Robert W.; and Fu, Wallace Y., to Union Carbide Corporation. Method for making thiobiscarbamates. 4,256,655, Cl. 260-453.0RW.
Atchison, Hugh C.; and Simmons, Bobby G., to Dow Chemical Company, The. High energy wash of ljungstrom air preheater. 4,256,511, Cl. 134-46.000.
Athe, Christian: *See*—
Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, 4,256,146, Cl. 138-111.000.
Athletic Training Equipment Company: *See*—
Smith, Tommy L.; Dierickx, Edward G.; Schade, Walter B., Jr.; and Pete, Leslie A., 4,256,304, Cl. 273-60.00B.
Atkins, Jack; and Cayce, William E., to Lifetime Industries. Mist filter for extracting moisture from outlet air from auto air conditioner. 4,256,472, Cl. 55-269.000.
Atkins, Richard S.; and Ray, Asim B., to Research-Cottrell, Inc. Regenerable process for SO_2 removal employing gelatinous aluminum hydroxide as absorbent. 4,256,712, Cl. 423-242.000.
Atkinson, Gary B., to United States of America, Interior. Preparation and use of high surface area transition metal catalysts. 4,256,653, Cl. 260-449.60M.
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Wolsky, Alfred A.; Papp, Richard B.; and Victor, James G., 4,256,912, Cl. 560-248.000.
Ato Chimie: *See*—
Marie, Gilbert, 4,256,874, Cl. 528-486.000.
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Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, 4,256,146, Cl. 138-111.000.
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Auer, Siegfried O., to Norlin Industries, Inc. Method and apparatus for thermal imaging. 4,257,106, Cl. 364-525.000.
Aumann, James T., to Christensen, Inc. Pressure core barrel. 4,256,192, Cl. 175-233.000.
Automated Building Components, Inc.: *See*—
Seipos, Andrew G., 4,255,914, Cl. 52-483.000.
Avco Corporation: *See*—
Waddington, Clive, 4,256,196, Cl. 180-65.00E.
Avigal, Yitzhak; Cahen, David; Hodes, Gary; and Manassen, Joost, to Yeda Research and Development Co. Ltd. Photoelectro-chemical cell system. 4,256,814, Cl. 429-111.000.
Ayres, Rand K.; and Sherif, Hassan A., to Northern Telecom Limited. Re-enterable duct seal. 4,256,920, Cl. 174-65.00R.
Aziende Chimiche Riunite Angelini Francesco: *See*—
Baiocchi, Leandro, 4,256,639, Cl. 260-325.00R.
Azuma, Kenkoku; and Ikeda, Akira, to Mitsubishi Denki KabushikiKaisha. Process for deodorization. 4,256,710, Cl. 423-210.000.
B. F. Goodrich Company, The: *See*—
Cohen, Louis, 4,256,864, Cl. 526-62.000.
Hsu, Chin C., 4,256,910, Cl. 560-209.000.
Landsness, Clifford A., 4,256,051, Cl. 118-107.000.
Riew, Changkiu K., 4,256,904, Cl. 560-104.000.
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Back, Harry E., Jr., to Champion International Corporation. System for overhead transport of panel members. 4,256,214, Cl. 198-367.000.
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., to Envirotech Corporation. Recovering copper from chalcopyrite concentrate. 4,256,553, Cl. 204-106.000.
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Bahder, George. Moisture resistant cable. 4,256,921, Cl. 174-107.000.
Bahl, Om P., to Research Corporation. Antigen for early pregnancy test and contraceptive vaccine. 4,256,629, Cl. 260-112.00B.
Bailey, Ronald B., to General Electric Company. Electric pulse shaping circuit. 4,256,982, Cl. 307-268.000.
Bailey, Wayne; and Cattell, Richard. Geothermal power producing loop. 4.255,933, Cl. 60-641.000.
Bain, Douglas I.: *See*—
Dixit, Shyam N. S.; Bain, Douglas I.; and Carter, David A., 4,256,703, Cl. 423-23.000.
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Baker, Alan S., to Imperial Chemical Industries Limited. Surfactant composition, and concentrate and emulsion including same. 4,256,605, Cl. 252-312.000.
Baker, Alfred L.: *See*—
Payne, Thomas R.; and Baker, Alfred L., 4,256,951, Cl. 219-492.000.

Baldwin, Fred. Blood incubator device. 4,256,697, Cl. 422-104.000.

Baldwin, John J.: *See*—
Novello, Frederick C.; and Baldwin, John J., 4,256,887, Cl. 544-333.000.

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Day, Ian H.; Baldwin, William A.; and Stern, Harold J., 4,256,795, Cl. 428-196.000.

Balhouse, Harold J., to Consolidated Controls Corporation; and Electric power Research Institute, Inc. High energy loss fluid flow control device. 4,256,284, Cl. 251-126.000.

Baniao, George M., to General Electric Company. Rock treating method and compositions. 4,256,501, Cl. 106-97.000.

Banks, Edward L., to Western Electric Company, Inc. Method of polishing a semiconductor wafer. 4,256,535, Cl. 156-645.000.

Banzai, Hideo: *See*—
Fujita, Shigeru; Banzai, Hideo; and Goto, Takashi, 4,256,678, Cl. 264-40.100.

Barbagli, Rino O., to Fiat-Allis Macchine Movimetno Terra S.p.A. Lever control for hydraulic control circuits. 4,256,144, Cl. 137-636.200.

Barbee, Robert B.: *See*—
Davis, Burns; Barbee, Robert B.; and Musser, Harry R., 4,256,860, Cl. 525-437.000.
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Barclay, Donald J.; Lowe, Anthony C.; and Martin, David H., to International Business Machines Corporation. Counter electrode arrangement of an electrochromic display device. 4,256,380, Cl. 350-357.000.

Barclay, Donald J.; and Vigar, James M. L., to International Business Machines Corporation. Elimination of anode hydrogen cyanide formation in trivalent chromium plating. 4,256,548, Cl. 204-43.00R.

Bardos, Andrew M., to Harris Corporation. Phase-insensitive hologram readout technique. 4,256,362, Cl. 350-3.860.

Barker, Brian G.: *See*—
Grymonprez, Paul A.; Ruyssers, Robert H. M.; and Barker, Brian G., 4,255,967, Cl. 73-168.000.

Barnard, Bryon G., to National Research Development Corporation. Collapsible marker cone. 4,256,050, Cl. 116-63.00C.

Barnard, Louis H., to Hughes Tool Company. Impact tool with hydraulic cocking mechanism. 4,256,187, Cl. 173-119.000.

Barnette, William E.: *See*—
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., 4,256,883, Cl. 544-235.000.

Barry Wright Corporation: *See*—
Peterson, Robert R., 4,256,354, Cl. 308-139.000.

Bartelt, James T.: *See*—
Carlson, Scott W.; and Bartelt, James T., 4,256,114, Cl. 128-419.0PT.

Barth, Wayne E., to Pfizer Inc. Acetoxymethyl penam compounds as β-lactamase inhibitors. 4,256,733, Cl. 424-114.000.

Barthe, Henry P.; and Cobb, William R., to Schroeder Brothers Corporation. Roof drilling and bolting apparatus. 4,256,186, Cl. 173-23.000.

Bartholic, David B., to Engelhard Minerals & Chemicals Corporation. Treatment of petroleum stocks containing metals. 4,256,567, Cl. 208-252.000.

Bartl, Herbert: *See*—
Roos, Ernst; Bartl, Herbert; Schuster, Klaus; and Schmidt, Adolf, 4,256,636, Cl. 260-192.000.

Bartlett, Kenneth E.: *See*—
Scholten, Dale A.; Schreiner, Frederick J.; Kenjesky, Raymond J.; and Bartlett, Kenneth E., 4,256,082, Cl. 126-110.0AA.

Barton, Danny B.; Halbleib, Chester W.; and Lonsinger, Jack J., to Mobay Chemical Corporation. Production of thiosemicarbazide. 4,256,661, Cl. 564-18.000.

Bartram, Trevor C.; and Raju, Bendapudi P. Current limiting devices. 4,257,080, Cl. 361-19.000.

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Degen, Hans-Juergen; Feichtmayr, Franz; and Grychtol, Klaus, 4,256,458, Cl. 8-506.000.
Horacek, Heinrich; Schoen, Ernst; Reich, Erhardt; and Volkert, Otto, 4,256,841, Cl. 521-51.000.
Jaedicke, Hagen; and Paust, Joachim, 4,256,643, Cl. 260-340.700.
Kranz, Joachim; Polster, Rudolf; Sappok, Reinhard; and Wiesenberger, Alois, 4,256,507, Cl. 106-288.00Q.
Kummer, Rudolf; Schneider, Heinz-Walter; Weiss, Franz-Josef; and Lemann, Otto, 4,256,909, Cl. 560-204.000.
Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, 4,256,754, Cl. 424-269.000.

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Brizgys, Bernardas; and Gallagher, James A., 4,256,848, Cl. 521-124.000.
Patil, Arvind S.; and Netherton, Lowell E., 4,256,508, Cl. 156-304.000.

Baskov, Jury A.: *See*—
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.

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Batcho, Andrew D.; Hengartner, Urs O.; Leimgruber, Willy; Scott, John W.; and Valentine, Donald, Jr., to Hoffmann-La Roche Inc. Novel syntheses of tryptophans. 4,256,641, Cl. 260-326.14T.

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Dufrane, Keith F.; and Snediker, David K., 4,255,974, Cl. 73-776.000.

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Bruhin, Rolf; and Rutimann, Peter, 4,257,030, Cl. 340-149.00R.

Baumann, Stephen F.; Nakabayashi, Masahiro; Uttrachi, Gerald D.; Coless, Thomas L.; and Levine, Ernest N., to Union Carbide Corporation. Method and wire for submerged arc welding of pipe. 4,256,949, Cl. 219-146.240.

Baxter Travenol Laboratories, Inc.: *See*—
Hannah, Richard E., 4,256,135, Cl. 137-375.000.
Lamadrid, Rene G.; and Cullis, Herbert M., 4,256,442, Cl. 417-477.000.
Soodak, Charles, 4,256,696, Cl. 422-72.000.

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Behr, Sigurd, 4,256,858, Cl. 525-375.000.
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, 4,256,862, Cl. 525-534.000.
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,256,882, Cl. 544-212.000.
Gehrke, Gunter; Kuhnel, Werner; and Kuth, Robert, 4,256,460, Cl. 8-532.000.
Goebel, Hermann; and Eitel, Kurt, 4,256,634, Cl. 260-149.000.
Horstmann, Harald; Bossert, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,256,749, Cl. 424-251.000.
Ick, Jurgen; Meiners, Hans J.; Oertel, Gunter; Hauptmann, Gunter; and Konig, Klaus, 4,256,849, Cl. 521-129.000.
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,256,740, Cl. 424-200.000.
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Petersen, Otto; and Schmidt, Hans-Dieter, 4,256,543, Cl. 204-1.00T.
Raue, Roderich, 4,256,900, Cl. 548-262.000.
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Schneider, Rudiger, 4,257,032, Cl. 340-171.00A.

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Roth, Walter, 4,256,356, Cl. 312-320.000.

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Beck, Nicholas J.: *See*—
Green, Peter T.; and Beck, Nicholas J., 4,256,263, Cl. 239-487.000.

Beckwith Electric Co., Inc.: *See*—
Wyatt, Michael A.; and Beckwith, Robert W., 4,256,972, Cl. 307-68.000.

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Rutner, Herman; and Dodd, Thomas F., 4,256,724, Cl. 424-1.000.
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Shoor, Bernard A., 4,256,106, Cl. 128-247.000.

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Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,256,762, Cl. 424-283.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,256,879, Cl. 542-427.000.
Ponsford, Roger J.; and Howarth, Thomas T., 4,256,638, Cl. 260-245.300.

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Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, to Thomson-CSF. Mesomorphous 4-alkoxytetrafluorobenzoic acid esters. 4,256,656, Cl. 260-465.00D.

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Aigner, Hansjorg; Behmel, Klaus; and Luttenberger, Johann, 4,256,620, Cl. 260-29.6HN.

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Bel-Tronics Corporation: *See—*
Zelazo, Ted S.; and Wright, Thomas J., 4,257,026, Cl. 336-90.000.
Belanger, Guy; and Missout, Gilles, to Hydro-Quebec. Apparatus for preparing ampullas. 4,256,152, Cl. 141-70.000.
Bell, Joseph P. Battery post clamp member. 4,256,361, Cl. 339-228.000.
Bell Telephone Laboratories, Incorporated: *See—*
Ammann, Hans H.; and Oien, Michael A., 4,256,512, Cl. 134-64.00R.
Dunkleberger, La Rue N., 4,256,816, Cl. 430-11.000.
Kazacos, Maria S.; and Miller, Barry, 4,256,544, Cl. 204-2.100.
Levinstein, Hyman J.; and Wang, David N., 4,256,534, Cl. 156-643.000.
Moran, John C., 4,257,097, Cl. 364-200.000.
Bend, John R.; Eling, Thomas E.; and McKinney, James D., to United States of America, Health, Education and Welfare. Synthesis of optically pure thromboxanes. 4,256,646, Cl. 260-345.80P.
Bender, John T., Jr.: *See—*
Stephenson, Roger B., 4,255,934, Cl. 60-655.000.
Bendix Corporation, The: *See—*
Eastman, James M., 4,256,017, Cl. 91-417.00R.
Kirner, Ernest O.; and Devensky, Walter L., 4,257,031, Cl. 340-149.00R.
Wilkinson, John R., 4,257,034, Cl. 340-347.0NT.
Benedict, James J., to Procter & Gamble Company, The. Oral compositions. 4,256,730, Cl. 424-52.000.
Benkoe, Elisabeth: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elonne, 4,255,894, Cl. 46-169.00A.
Benkoe, Elisabeth, executrix: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elonne, 4,255,894, Cl. 46-169.00A.
Benkoe, Erwin, deceased: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elonne, 4,255,894, Cl. 46-169.00A.
Benner, Roland G.; and Henson, Paul D., to Mallinckrodt, Inc. Para-aminophenol derivatives. 4,256,669, Cl. 564-434.000.
Bennett, John E.; and Elliott, Joseph E., to Diamond Shamrock Corporation. Anodically polarized surface for biofouling and scale control. 4,256,556, Cl. 204-147.000.
Berg, Charles A., to Pyreflex Corp. Temperature confining devices and method. 4,256,919, Cl. 13-23.000.
Berger, L. Joseph, Jr.; and Guequierre, Denis D., to Finite Filter Company, Inc. Filter housing and filter assemblies utilizing the same. 4,256,474, Cl. 55-482.000.
Berglund, Ake; and Fries, Ake, to AB Asea-Atom. Sealing device for temporary pressure sealing. 4,256,314, Cl. 277-27.000.
Bergman, Sven A.; Ohlsson, Per J.; and Nordqvist, Karl-Gustav E., to Rederiaktiebolaget Nordstjernan. Method and apparatus for sensing and maintaining oscillations in an oscillating system. 4,257,010, Cl. 331-65.000.
Berkley and Company, Inc.: *See—*
McMickle, Robert L.; Ader, Gary B.; and Grice, Steven L., 4,255,880, Cl. 37-43.00B.
Bernhard Forster GmbH: *See—*
Forster, Rolf, 4,256,455, Cl. 433-8.000.
Berry, William W.: *See—*
Allen, Hanceford L.; and Berry, William W., 4,256,570, Cl. 209-5.000.
Bertus, Brent J.: *See—*
Roberts, John S.; Bertus, Brent J.; and McKay, Dwight L., 4,256,564, Cl. 208-120.000.
Berwind Corporation: *See—*
Klieman, Kenneth J., 4,255,859, Cl. 33-126.600.
Besseling, Johann L. N.: *See—*
Samuels, Basil J.; and Besseling, Johann L. N., 4,256,998, Cl. 318-335.000.
Besson, Raymond J., to Etat Francais represente par le Delegue General Pour l'Armement. Piezoelectric resonator. 4,257,020, Cl. 333-187.000.
Besson, Rene, to Ebauches S.A. Electronic watch with touch-sensitive keys. 4,257,117, Cl. 368-69.000.
Bethlehem Steel Corporation: *See—*
Mazer, Marshall R.; Jassund, Steven A.; and Herman, Stewart T., 4,256,468, Cl. 55-8.000.
Beyer, Karl, to La Nationale S.A. Bearing screw and its use as a hinge-pin in spectacles. 4,256,388, Cl. 351-158.000.
Bhargava, Hridaya N.: *See—*
Curtis, Stephen N.; and Bhargava, Hridaya N., 4,256,731, Cl. 424-54.000.
Bhargava, Pankaj, to Sterling Drug Inc. Ozone disinfection system. 4,256,574, Cl. 210-614.000.
Bianchi, John E.; and Nichols, Richard D. E., to Bianchi Leather Products, Inc. Holster with hesitation lock. 4,256,243, Cl. 224-244.000.
Bianchi Leather Products, Inc.: *See—*
Bianchi, John E.; and Nichols, Richard D. E., 4,256,243, Cl. 224-244.000.
Bibrach & Rehberg: *See—*
Kohler, Emil K., 4,256,498, Cl. 106-55.000.
Bickel, Hans: *See—*
Woodward, Robert B.; and Bickel, Hans, 4,256,739, Cl. 424-200.000.
Bier-Drive AG: *See—*
Mockesch, Erich, 4,256,150, Cl. 141-5.000.
Bilbao, Francisco. Grapefruit cutting knife. 4,255,854, Cl. 30-114.000.
Bilenko, Leonid F.: *See—*
Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M., 4,256,709, Cl. 423-119.000.
Bilitch, Michael, to American Technology, Inc. Leadless cardiac pacer. 4,256,115, Cl. 128-419.00P.
Biltonen, Rodney L.; Mountcastle, Donald B.; and Suurkuust, Jaak, to University of Va. Alumni Patents Foundation. Differential calorimeter based on the heat leak principle. 4,255,961, Cl. 73-15.00B.
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, to Bayer Aktiengesellschaft. Polyaryl-sulphones containing an ammonium or metal salt of an organic sulphonic acid. 4,256,862, Cl. 525-534.000.
Biondi, Dennis P.: *See—*
Johnson, Raymond V.; and Biondi, Dennis P., 4,256,052, Cl. 118-719.000.
BioResearch Inc.: *See—*
Findl, Eugene; and Cundell, Anthony M., 4,256,832, Cl. 435-6.000.
Biotronik Mess-und Therapiegerate GmbH & Co.: *See—*
Nagel, Joachim, 4,256,118, Cl. 128-733.000.
Birmingham, Robert A., to Owen Lumber & Millwork, Inc. Handrail and method of making the same. 4,256,287, Cl. 256-59.000.
Birt, David R.; and Brandhuber, John A., to Communications Patents Limited. Device for monitoring the performance of a transmitter. 4,257,123, Cl. 455-115.000.
Bishop, Roy I. Screed for leveling freshly poured concrete. 4,256,416, Cl. 404-119.000.
Biszantz, Donald W.; Landers, Russell H.; Sexton, James H.; and Iammarino, Dominic J., to Easco Tools, Inc. Multi-tension hacksaw. 4,256,156, Cl. 145-33.00A.
Biuro Projektowo-Konstrukcyjne Mechanizacji Budownictwa Zremb: *See—*
Tarasiuk, Stefan, 4,255,829, Cl. 15-303.000.
Bjorkman, Harry K., Jr., to Energy Development Associates, Inc. Electrolytic cell for separating chlorine gas from other gases. 4,256,554, Cl. 204-128.000.
Black, Archie L., to Placer Exploration Limited. Coating composition for steel containing zinc metal, zinc oxide, molybdenum sulfide, a resin and a solvent. 4,256,811, Cl. 428-562.000.
Black, Sigmund; Lagowski, Joseph V.; Whitt, Jerry C.; and Plumley, Roger D., to Fairchild Incorporated. Mechanism for advancing continuous mining machine through mining cycle and tramming modes. 4,256,343, Cl. 299-31.000.
Black, Steven. Bottle with retractable funnel top. 4,256,154, Cl. 141-98.000.
Blair Manufacturing Company: *See—*
Ryan, Kelly P., 4,256,031, Cl. 100-65.000.
Blakey, Philip G.; and Watson, Richard W., to BOC Limited. Combustion method and apparatus. 4,256,721, Cl. 423-540.000.
Blankenship, John E.; and Hoback, Roy W., to United States of America, Navy. Method of charging and hermetically sealing high pressure gas container. 4,255,916, Cl. 53-404.000.
Blickle, Tibor; Komaromy, Zsigmond; Filka, Judit; Gyenis, Janos; and Borlai, Oszkar, to Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezet. Process for segregating solid substances from a liquid phase. 4,256,576, Cl. 62-538.000.
Bljumberg, Erna A.; Maslov, Sergei A.; Emanuel, Nikolai M.; Merzhanov, Alexandr G.; and Borovinskaya, Inna P. Process for preparing propylene oxide and acetic acid. 4,256,650, Cl. 260-348.330.
Blomberg, Knut H. Telephone set with storing box. 4,256,929, Cl. 179-100.00D.
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, to Xerox Corporation. Magnetic or electrostatographic imaging and high speed fusing method uses polyamide resin in toner. 4,256,818, Cl. 430-39.000.
Blount, David H. Process for the production of organic hydroxy silicate compounds and their resinous products. 4,256,873, Cl. 528-425.000.
Blyth, Victoria S. Process for preserving pastel works of art. 4,257,083, Cl. 361-234.000.
Bobkova, Olga S.; Slotvinsky-Sidak, Nikolai P.; Travin, Oleg V.; and Frolov, Averky A. Process for producing vanadium-containing alloys. 4,256,487, Cl. 75-134.00V.
BOC Limited: *See—*
Blakey, Philip G.; and Watson, Richard W., 4,256,721, Cl. 423-540.000.
Bodine, Albert G. Sonically assisted lubrication of journal bearings. 4,256,190, Cl. 175-56.000.
Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,256,756, Cl. 424-273.00R.
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,256,747, Cl. 424-250.000.
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.
Boeing Company, The: *See—*
Porter, David R.; Reese, Irving R.; and Von Bokern, Greg J., 4,257,124, Cl. 455-601.000.
Van Wyk, Jan W., 4,256,489, Cl. 75-173.00R.
Bogaenko, Ivan N.: *See—*
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Bohannon, John M., to Conoco, Inc. Variable stiffness lower joint for pipe riser with fixed bottom. 4,256,417, Cl. 405-195.000.

Boisset, Michel L.; and Martelli, Louis P. Union for tubes having a smooth end. 4,256,334, Cl. 285-247.000.

Bolin, Philip C.: *See*—
Cookson, Alan H.; and Bolin, Philip C., 4,256,254, Cl. 228-166.000.

Boll & Kirch Filterbau GmbH: *See*—
Lennartz, Rudiger, 4,256,583, Cl. 210-333.100.

Bolles, Milton M., to Milliken Research Corporation. Carpet cutting method. 4,255,992, Cl. 83-23.000.

Bolotov, Albert A.: *See*—
Tyrtyshny, Vladilen M.; and Bolotov, Albert A., 4,256,536, Cl. 159-16.00S.

Bolton, Jimmie B.; and Crews, Sam T., to Smith International, Inc. Welding and austenitizing earth boring apparatus. 4,256,518, Cl. 148-127.000.

Boman, Karl G.; and Schermutzki, Konrad, to Sandvik Conveyor GmbH. Apparatus for preparing granular material by means of a strip caster. 4,256,581, Cl. 210-173.000.

Boning, Bernward: *See*—
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.

Bories, David: *See*—
Webb, Norman J.; and Bories, David, 4,257,039, Cl. 340-629.000.

Borlai, Oszkar: *See*—
Blickle, Tibor; Komaromy, Zsigmond; Filka, Judit; Gyenis, Janos; and Borlai, Oszkar, 4,256,576, Cl. 62-538.000.

Borovinskaya, Inna P.: *See*—
Bljumberg, Erna A.; Maslov, Sergei A.; Emanuel, Nikolai M.; Merzhanov, Alexandr G.; and Borovinskaya, Inna P., 4,256,650, Cl. 260-348.330.

Boschi, Pier M.; Gozzo, Franco; and Longoni, Angelo, to Montedison S.p.A. Process for the preparation of 3-chloro-5-hydroxypyrazoles. 4,256,902, Cl. 548-365.000.

Bosco, Lewis R.: *See*—
Witt, Alvin E.; and Bosco, Lewis R., 4,256,798, Cl. 428-215.000.

Bossert, Friedrich: *See*—
Horstmann, Harald; Bossert, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,256,749, Cl. 424-251.000.

Boucaut, Alain: *See*—
Vasseur, Bernard; and Boucaut, Alain, 4,256,357, Cl. 339-21.00R.

Boucher, Raymond W., to Hedstrom Co. Foldable play gym. 4,256,300, Cl. 272-85.000.

Bouloy, Jose B. Ice making machine and method. 4,255,941, Cl. 62-347.000.

Bourbon, Raymond, to Centre Technique Industriel dit "Centre Technique des Industries Aerauliques et Thermiques". Liquid fuel burner. 4,256.450, Cl. 431-337.000.

Bourns Medical Systems, Inc.: *See*—
Ellestad, Raymond A., 4,256,101, Cl. 128-204.230.

Boutonnat, Maurice; and Rose, Gerard, to Charbonnages de France. Apparatus for measuring and/or monitoring a constituent of an atmosphere. 4,255,960, Cl. 73-27.00R.

Bovet, Thomas, to Uptrend Products Ltd. Writing and weighing instruments. 4,256,195, Cl. 177-232.000.

Bowerman, William J., to BRS, Inc. Athletic shoe having external heel counter. 4,255,877, Cl. 36-129.000.

Bowers, James C.: *See*—
Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., 4,257,007, Cl. 328-167.000.

Boyd, Raymond. Nail polish remover. 4,255,826, Cl. 15-21.00R.

Boyer, Adrian J.; Richardson, William R.; Metcalfe, Robert J.; and Foden, Peter J., to Boyer, Adrion J.; Richardson, William R.; and Metcalfe, Robert J. Apparatus for moving and/or transporting loads. 4,255,823, Cl. 5-81.00R.

Boyer, Adrion J.: *See*—
Boyer, Adrian J.; Richardson, William R.; Metcalfe, Robert J.; and Foden, Peter J., 4,255,823, Cl. 5-81.00R.

Boyer, Robert C.; and Williams, George J., to Ecolaire Incorporated. Condenser construction with delayed tube bundles. 4,255,841, Cl. 29-157.400.

BP Chemicals Limited: *See*—
Hyde, David L.; and Kirkwood, Kenneth C., 4,256,865, Cl. 526-124.000.

Braddick, Peter W., to Garrett Corporation, The. Turbocharger control actuator. 4,256,019, Cl. 92-94.000.

Bradley, Laird P.; Carder, Bruce M.; and Gagnon, William L., to United States of America, Energy. Post pulse shutter for laser amplifier. 4,257,017, Cl. 332-7.510.

Bradshaw, Cyril E., to Eaton Corporation. Exhaust gas recycling modulator valve assembly. 4,256,076, Cl. 123-568.000.

Braemer, Frank C., to Envirotech Corporation. Process for off-gas recovery. 4,256,466, Cl. 48-197.00R.

Braithwaite, Philip, to Tungum Hydraulics Limited. Actuators. 4,255,899, Cl. 49-2.000.

Brandenstein, Manfred: *See*—
Kunkel, Heinrich; Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,256,193, Cl. 175-371.000.

Brandhuber, John A.: *See*—
Birt, David R.; and Brandhuber, John A., 4,257,123, Cl. 455-115.000.

Brandon, Deryck. Apparatus and method for thawing materials stored in gondola-type containers. 4,256,944, Cl. 219-10.55F.

Brandrup, Johannes: *See*—
Fischer, Edgar; Brandrup, Johannes; and Weinlich, Jurgen, 4,256,854, Cl. 525-242.000.

Brandstatter, Hans G., to Ontario Research Foundation. Production of metal carbides in pure form. 4,256,496, Cl. 106-43.000.

Braun, Roland, to Raschig GmbH. Packing element for use in packed columns. 4,256,673, Cl. 261-94.000.

Brazil, John W. Nutcracker. 4,255,855, Cl. 30-120.500.

Brecker, Lawrence R.; and Keeley, Charles, to Argus Chemical Corporation. Antimony mercaptocarboxylic acid or ester-mercaptocarboxylic acid ester stabilizers for rigid polyvinyl chloride resin compositions. 4,256,618, Cl. 260-23.0XA.

Brenner, Daniel G.: *See*—
Shepard, Kenneth L.; and Brenner, Daniel G., 4,256,889, Cl. 546-63.000.

Brewer, Gordon A.: *See*—
Shaw, Howard A.; and Todhunter, John D., 4,256,213, Cl. 198-303.000.

Bridgestone Tire Co., Ltd.: *See*—
Ohashi, Takashi; Okuyama, Toru; and Suzuki, Akira, 4,256,799, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Kaneda, Hiroshi; Taniguchi, Yoshiko; and Yoshida, Masako, 4,256,846, Cl. 521-117.000.
Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, 4,256,503, Cl. 106-100.000.

Bright, Donald G.: *See*—
Morris, Harold B.; and Bright, Donald G., 4,256,845, Cl. 521-61.000.

Briones, Robert A., to United States of America, Air Force. Speckle suppression of holographic microscopy. 4,256,363, Cl. 350-3.860.

Britax (Windgard) Limited: *See*—
Burleigh, David W., 4,256,273, Cl. 242-107.40R.

Britton, Arthur. Fabrics. 4,256,522, Cl. 156-178.000.

Brizgys, Bernardas; and Gallagher, James A., to BASF Wyandotte Corporation. Synergistic polyurethane co-catalysts which are a combination of an organo-mercuric compound and a zinc salt of an alkyl carboxylic acid. 4,256,848, Cl. 521-124.000.

Brodowski, Walter: *See*—
Schulze, Helmut; Zengel, Hans; Brodowski, Walter; Huntjens, Franciscus J.; Schutijser, Jan A. J.; and Hentschel, Peter, 4,256,869, Cl. 528-67.000.

Broning, Jorg: *See*—
Lindemann, Eckhard; Broning, Jorg; and Asbach, Dietrich, 4,257,042, Cl. 340-716.000.

Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., to United States of America, Navy. Active high-power bandpass filter. 4,257,007, Cl. 328-167.000.

Brooks, Lesley P. Magnetic game. 4,256,307, Cl. 273-118.00A.

Brooks, Steven W.; and Favrou, John M., to Spin Physics, Inc. Web transport system. 4,256,996, Cl. 318-7.000.

Brown, Boveri & Cie AG: *See*—
Holzwarth, Siegfried, 4,255,868, Cl. 34-12.000.

Brown, Craig K., to United States of America, Navy. Magnetic flip-flop for hydrophone preamplifier. 4,257,082, Cl. 361-191.000.

Brown, Fon R., to Stewart Naumann Laboratories, Inc. Peristaltic infusion pump and method. 4,256,437, Cl. 417-45.000.

Brown & Williamson Tobacco Corporation: *See*—
Johnson, Robert R., 4,256,122, Cl. 131-10.00A.

BRS, Inc.: *See*—
Bowerman, William J., 4,255,877, Cl. 36-129.000.
Johnson, Jeffrey O., 4,255,876, Cl. 36-83.000.

Bruce, Mitchell R. M.: *See*—
Treharne, Richard W.; McKibben, Charlton K.; Moles, Donald R.; and Bruce, Mitchell R. M., 4,256,967, Cl. 250-544.000.

Brugger, Robert, to Langbein-Pfanhauser Werke AG. Method of making a baking form for improved browning of baked goods. 4,256,546, Cl. 204-33.000.

Bruhin, Rolf; and Rutimann, Peter, to Bauer Kaba AG. Electronically coded cylinder lock and key. 4,257,030, Cl. 340-149.00R.

Brunet, Roger; and Marenco, Gerard, to Constructions Navales et Industrielles de la Mediterranee. Device for assembling floating box caissons. 4,256,049, Cl. 114-77.00R.

Brusaglino, Giampiero; and Peri, Giorgio, to Fiat Societa per Azioni. Apparatus for the supply, regulation and control of direct current electrical machines. 4,256,997, Cl. 318-254.000.

Buchel, Karl H.: *See*—
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., 4,256,830, Cl. 430-372.000.

Buchwalter, Stephen L.; Jerabek, Robert D.; Chou, Lee-Pei H.; and Christenson, Roger M., to PPG Industries, Inc. Curable resinous compositions useful in coating applications. 4,256,560, Cl. 204-181.00C.

Buckelew, Arthur L. Aircraft visual collision and avoidance device. 4,256,366, Cl. 350-97.000.

Buckler, Ernest J.; and Feniak, George, to Polysar Limited. Halobutyl of improved green strength. 4,256,857, Cl. 525-331.000.

Budde, Richard B. Mattress assembly for treatment of patients. 4,256,096, Cl. 128-70.000.

Buell, Eugene F.: *See*—
Shaw, Howard A.; and Todhunter, John D., 4,256,213, Cl. 198-303.000.

Bunker Ramo Corporation: *See*—
Kraft, Dennis, 4,256,699, Cl. 422-166.000.

Burgess, Leonard G.; and Wroblewski, Richard E., to Equipment Manufacturing, Inc. Latch assembly for dunnage bars. 4,256,425, Cl. 410-149.000.

Burgess, Ronald R., to Tom McGuane Industries, Inc. Throttle control dash pot. 4,256,293, Cl. 267-123.000.

Burleigh, David W., to Britax (Windgard) Limited. Safety belt retractors. 4,256,273, Cl. 242-107.40R.

Burroughs Corporation: *See*—
Schwartz, Sidney J., 4,257,109, Cl. 365-11.000.

Burton, Gordon D., to Ferro Corporation. Air-fuel mixing device. 4,256,044, Cl. 110-104.00R.

Burton, Phillip F.; and Hukki, Risto T., to Foskem (Proprietary) Limited of "Wegsteek". Recovery of minerals from ultra-basic rocks. 4,256,267, Cl. 241-24.000.

Busacca, Guido; Luparello, Pietro; and Meli, Vincenzo. Cooling system for tunable microwave generator. 4,256,990, Cl. 315-39.610.

Buscho, Lane M.: *See*—
Gross, Raymond J.; and Buscho, Lane M., 4,256,306, Cl. 273-85.00R.

Bush, Jerome J., to Sealed Power Corporation. Piston ring. 4,256,318, Cl. 277-221.000.

Buss, Merle D. Tractor front mounted round bale carrier. 4,256,426, Cl. 414-24.500.

Busse-Machukas, Vladimir B.: *See*—
Kubasov, Vladimir L.; Jurkov, Leonid I.; Busse-Machukas, Vladimir B.; Kokhanov, Georgy N.; and Lvovich, Florenty I., 4,256,563, Cl. 204-290.00F.

C. A. Weidmuller K.G.: *See*—
Obst, Rudiger; Wilmes, Manfred; and Murray, Peter E., 4,255,838, Cl. 24-255.0BS.

C. R. Bard, Inc.: *See*—
Cover, Walter E., 4,256,692, Cl. 422-46.000.

Cahen, David: *See*—
Avigal, Yitzhak; Cahen, David; Hodes, Gary; and Manassen, Joost, 4,256,814, Cl. 429-111.000.

California Institute of Technology: *See*—
Cuk, Slobodan M., 4,257,087, Cl. 363-16.000.

Calundann, Gordon W., to Celanese Corporation. Polyester of 6-hydroxy-2-naphthoic acid, aromatic diol, and aromatic diacid capable of undergoing melt processing. 4,256,624, Cl. 260-40.00R.

Campillo, Louis; and Nicolas, Gerard, to Commissariat a l'Energie Atomique. Method for interconnecting the terminals of electrical assemblies. 4,255,853, Cl. 29-843.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Fjarlie, Earl J., 4,256,405, Cl. 356-346.000.

Canadian Patents and Development Limited: *See*—
Thebeau, Vital J., 4,255,892, Cl. 43-81.000.

Cannady, Daniel L., Jr.; and Palazzolo, Salvatore E., to Westinghouse Electric Corp. Embossing assembly for high pressure laminate surfaces. 4,256,793, Cl. 428-137.000.

Canon Kabushiki Kaisha: *See*—
Komori, Shigehiro; and Katayama, Hajime, 4,256,400, Cl. 355-14.0SH.
Minoura, Kazuo; Tateoka, Masamichi; and Minami, Setsuo, 4,256,364, Cl. 350-6.900.
Skawa, Kazuo, 4,256,994, Cl. 315-151.000.
Someya, Atsushi, 4,256,371, Cl. 350-423.000.
Takahashi, Teruomi; and Matsuo, Takehiko, 4,256,823, Cl. 430-66.000.

Cantrell, Ronald T.; and Allison, Blaine H., to Allison Mfg., Inc. Liftable tandem axle suspension. 4,256,326, Cl. 280-683.000.

Caran, Richard C.: *See*—
Anderson, William E.; and Caran, Richard C., 4,255,893, Cl. 46-74.00D.

Carder, Bruce M.: *See*—
Bradley, Laird P.; Carder, Bruce M.; and Gagnon, William L., 4,257,017, Cl. 332-7.510.

Cardiac Pacemakers, Inc.: *See*—
Carlson, Scott W.; and Bartelt, James T., 4,256,114, Cl. 128-419.0PT.

Carl Still, Firma: *See*—
Strobel, Manfred; and Thiersch, Friedrich, 4,256,540, Cl. 202-139.000.

Carl, Vincent P. Hydroponic growing apparatus. 4,255,896, Cl. 47-62.000.

Carle, George E., to USM Corporation. Roller die. 4,256,448, Cl. 425-367.000.

Carlisle, Richard S. Method of forming plastic-film articles. 4,256,024, Cl. 493-343.000.

Carlson, Scott W.; and Bartelt, James T., to Cardiac Pacemakers, Inc. Refractory measurement circuitry. 4,256,114, Cl. 128-419.0PT.

Carmon, Amiram: *See*—
Meretsky, Paul L.; and Carmon, Amiram, 4,256,116, Cl. 128-421.000.

Carnahan, Thomas G.; and Flynn, Charles M., Jr., to United States of America, Interior. Siliceous adsorbent for heavy metals. 4,256,587, Cl. 210-670.000.

Carnahan, Thomas G.: *See*—
Flynn, Charles M., Jr.; Carnahan, Thomas G.; and Lindstrom, Roald E., 4,256,707, Cl. 423-42.000.

Carol, David J.: *See*—
Carol, Mark P.; and Carol, David J., 4,255,821, Cl. 3-1.700.

Carol, Mark P.; and Carol, David J. Artificial heart pump. 4,255,821, Cl. 3-1.700.

Carr, James B.: *See*—
Lewis, Raymond H., Jr.; and Carr, James B., 4,256,089, Cl. 126-420.000.

Carrier Corporation: *See*—
Schafer, James P., 4,256,475, Cl. 62-2.000.

Carrier, Gerald B., to Corning Glass Works. Process for producing porous spinel materials. 4,256,722, Cl. 423-594.000.

Carter, David A.: *See*—
Dixit, Shyam N. S.; Bain, Douglas I.; and Carter, David A., 4,256,703, Cl. 423-23.000.

Carter, Dorothy P., to Teledyne Industries, Inc. Preparation of zirconium oxychloride. 4,256,463, Cl. 23-296.000.

Carter, Philip S.; and Krumme, John F., to Iris Associates. Alternating current electrically resistive heating element having intrinsic temperature control. 4,256,945, Cl. 219-10.750.

Carver, Bobby C.; and Donaldson, Raymond E., to Eastman Kodak Company. Fiber treating compositions comprising (a) blend of random copoly(oxyethylene-oxypropylene)butanols (b) alkali metal sulfur compound and (c) alkali metal organic phosphate compound. 4,256,589, Cl. 252-8.700.

Cascarano, Wayne A.: *See*—
Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., 4,256,807, Cl. 428-379.000.

Case, Barton C.: *See*—
Kroplinski, Thaddeus F.; and Case, Barton C., 4,256,617, Cl. 260-18.0TN.

Cassella, Vincent J.; and Irani, Mazin R., to PQ Corporation. Two step removal of metal ions from effluents. 4,256,577, Cl. 210-738.000.

Casull, Don C., to Deseret Automotive Research, Inc. Torch chamber apparatus and method for a spark plug of an internal combustion engine. 4,256,071, Cl. 123-266.000.

Caterpillar Tractor Co.: *See*—
Hoefer, Wayne A., 4,256,350, Cl. 303-6.00M.
Mitchell, Roger R.; Trayler, Robert J.; and Wilson, Eugene M., 4,255,885, Cl. 37-126.0AE.
Reinsma, Harold L., 4,256,316, Cl. 277-92.000.

Cattell, Richard: *See*—
Bailey, Wayne; and Cattell, Richard, 4,255,933, Cl. 60-641.000.

Cavitron Corporation: *See*—
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,256,529, Cl. 156-515.000.

Cayce, William E.: *See*—
Atkins, Jack; and Cayce, William E., 4,256,472, Cl. 55-269.000.

Celanese Corporation: *See*—
Calundann, Gordon W., 4,256,624, Cl. 260-40.00R.
Hannon, Martin J.; and Forschirm, Alex S., 4,256,232, Cl. 215-12.00R.
Vanderspurt, Thomas H.; and Taylor, Paul D., 4,256,675, Cl. 261-128.000.

Centre Technique Industriel dit "Centre Technique des Industries Aerauliques et Thermiques": *See*—
Bourbon, Raymond, 4,256,450, Cl. 431-337.000.

Ceres Corporation: *See*—
Ashman, Leland E., 4,255,962, Cl. 73-15.00A.

Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M. Device for controlling shape of strip or sheet being rolled. 4,255,954, Cl. 72-19.000.

Chamberlin, Thomas A.; and Tomalia, Donald A., to Dow Chemical Company, The. Metal salt complexes of vinyl-substituted cyclic polyether addition polymers. 4,256,855, Cl. 525-326.000.

Chamness, Dale L. Surgical apparatus. 4,256,113, Cl. 128-303.140.

Champion International Corporation: *See*—
Back, Harry E., Jr., 4,256,214, Cl. 198-367.000.
Fremont, Henry A., 4,256,630, Cl. 260-112.00R.
Tate, Dan C., 4,256,491, Cl. 106-2.000.
Tate, Dan C., 4,256,628, Cl. 260-97.700.

Champion Spark Plug Company: *See*—
Knapp, Randy O., 4,256,497, Cl. 106-48.000.

Chapel, Roy W., Jr.; and Gurol, I. Macit, to John Fluke Mfg. Co., Inc. Thermally isolated monolithic semiconductor die. 4,257,061, Cl. 357-69.000.

Chapman, Ernest M. Pre-set fluid pressure regulator. 4,256,138, Cl. 137-505.420.

Charbonnages de France: *See*—
Boutonnat, Maurice; and Rose, Gerard, 4,255,960, Cl. 73-27.00R.

Charles F. Kettering Foundation: *See*—
Treharne, Richard W.; McKibben, Charlton K.; Moles, Donald R.; and Bruce, Mitchell R. M., 4,256,967, Cl. 250-544.000.

Chautard, Jean; and Chemizard, Andre, to Compagnie Generale des Etablissements Michelin. Pneumatic tire with puncture-sealing lining comprising a vulcanizable layer and a dispersed vulcanization component. 4,256,158, Cl. 152-330.0RF.

Chem Systems Inc.: *See*—
Jung, John A.; and Peress, Jimmy, 4,256,913, Cl. 562-521.000.

Chemed Corporation: *See*—
Dixit, Shyam N. S.; Bain, Douglas I.; and Carter, David A., 4,256,703, Cl. 423-23.000.

Chemie Linz Aktiengesellschaft: *See*—
Wittmann, Erwin; Diskus, Alfred; and Auer, Engelbert, 4,256,482, Cl. 71-92.000.

Chemische Fabrik Stockhausen & Cie: *See*—
Stockhausen, Dolf; and Peppmoller, Reinmar, 4,256,800, Cl. 428-245.000.

Chemische Werke Huls AG: *See*—
Gras, Rainer, 4,256,788, Cl. 428-35.000.
Chemizard, Andre: *See*—
Chautard, Jean; and Chemizard, Andre, 4,256,158, Cl. 152-330.0RF.
Chen, Chang C. Automatic animal-trapping device. 4,255,891, Cl. 43-64.000.
Cheung, Derek T.; Andrews, A. Mike, II; and Longo, Joseph T., to Rockwell International Corporation. Self-multiplexed monolithic intrinsic infrared detector. 4,257,057, Cl. 357-24.000.
Cheylus, Jean-Francois: *See*—
Badoureaux, Jean-Pierre; and Cheylus, Jean-Francois, 4,256,018, Cl. 92-58.000.
Chiappetti, Arthur B. Toll collection station arrangement. 4,256,128, Cl. 133-8.00E.
Chino, Yasuyoshi: *See*—
Miyaguchi, Akinori; Morita, Yasuomi; and Chino, Yasuyoshi, 4,256,619, Cl. 260-23.70C.
Chion, Pierre: *See*—
Achard, Georges; Anouilh, Gilbert; Chion, Pierre; and Vincent, Roger, 4,256,684, Cl. 264-168.000.
Chisum, Finis L. Tire bead demounting apparatus. 4,256,161, Cl. 157-1.170.
Chiyoda Chemical Engineering and Construction Co., Ltd.: *See*—
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.
Chodnekar, Madhukar S.; and Kaiser, Ado, to Hoffmann-La Roche Inc. Imidazo[2,1-b]quinazolin-2(3H)-ones and pharmaceutical compositions for treatment and prophylaxis of cardiac insufficiency and cardiac failure. 4,256,748, Cl. 424-251.000.
Choe, Pil Y., to Man Bo Inc. Switching device for preventing prolonged electrical contact. 4,256,933, Cl. 200-34.000.
Choksi, Pradip V.; Christoffel, William D.; and Edwards, Christopher J. C., to American Hospital Supply Corporation. Needle destroyer with improved mechanical advantage. 4,255,996, Cl. 83-140.000.
Chou, Lee-Pei H.: *See*—
Buchwalter, Stephen L.; Jerabek, Robert D.; Chou, Lee-Pei H.; and Christenson, Roger M., 4,256,560, Cl. 204-181.00C.
Christensen, Inc.: *See*—
Aumann, James T., 4,256,192, Cl. 175-233.000.
Christenson, Roger M.: *See*—
Buchwalter, Stephen L.; Jerabek, Robert D.; Chou, Lee-Pei H.; and Christenson, Roger M., 4,256,560, Cl. 204-181.00C.
Christine, William C. Dispenser having a roller for squeezing amounts from a tube. 4,256,242, Cl. 222-207.000.
Christoffel, William D.: *See*—
Choksi, Pradip V.; Christoffel, William D.; and Edwards, Christopher J. C., 4,255,996, Cl. 83-140.000.
Christopher, James S. Sound enhancement system for television receivers. 4,257,067, Cl. 358-189.000.
Chubukov, Vladimir K.: *See*—
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.
Chuluda, Philip A., to Raybestos-Manhattan, Incorporated. Carbon fiber/flame-resistant organic fiber sheet as a friction material. 4,256,801, Cl. 428-280.000.
Chunzu Machinery Industry Co., Ltd.: *See*—
Lee, Shi C., 4,255,955, Cl. 72-31.000.
Ciba-Geigy Aktiengesellschaft: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,256,896, Cl. 548-160.000.
Ciba-Geigy Corporation: *See*—
Beffa, Fabio, 4,256,633, Cl. 260-145.00C.
Eldin, Sameer H.; and Stockinger, Friedrich, 4,256,867, Cl. 526-263.000.
Moser, Paul; Rody, Jean; and Karrer, Friedrich, 4,256,627, Cl. 260-45.75N.
Walker, Gordon N., 4,256,759, Cl. 424-274.000.
Woodward, Robert B.; and Bickel, Hans, 4,256,739, Cl. 424-200.000.
Ciminera, Victor R.; and Hendrickson, Ronald H., to Grumman Aerospace Corporation. Adjustable airplane appendages for wave drag reduction. 4,256,276, Cl. 244-118.100.
Cioc, Alexander; Kunzel, Werner; and Meyer, Klaus, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Container with a synthetic lining impermeable to liquids and method of making. 4,256,231, Cl. 215-1.00C.
Ciolli, Donald A., to Rotor Tool Company. Reversible speed reduction mechanism. 4,255,987, Cl. 74-768.000.
Cities Service Company: *See*—
Urban, Eugene M., Jr., 4,256,723, Cl. 423-633.000.
Citizen Watch Co., Ltd.: *See*—
Futaba, Kunihiko; Shimazaki, Toshikazu; Osagawa, Atsumi; and Hiraoka, Akira, 4,257,118, Cl. 368-276.000.
Hatuse, Toshikazu; Natori, Minoru; Shimazaki, Toshikazu; Kawanobe, Kouhei; and Ogawa, Hiroshi, 4,257,115, Cl. 368-69.000.
Sekiya, Fukuo; and Maekawa, Yuzo, 4,257,114, Cl. 368-62.000.
Clark, Clinton B., Jr.; Corbett, Scott S., Jr.; and VanDuyn, Allen E. Cantilever straddle carrier. 4,256,230, Cl. 212-216.000.
Clark, Justin S.: *See*—
Wallace, William D.; Cutler, Christopher A.; Clark, Justin S.; and Farr, Frederick L., 4,256,461, Cl. 23-230.00B.
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., to Cavitron Corporation. Ultrasonic apparatus for manufacturing brassiere tapes. 4,256,529, Cl. 156-515.000.
Clay, Bobby J., to Natmar, Inc. Label machine. 4,255,997, Cl. 83-175.000.
Clayton Aniline Company, Ltd.: *See*—
Hildreth, John D.; Haslam, David G.; and Allen, David E., 4,256,671, Cl. 564-422.000.
Clayton, John P.: *See*—
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,256,762, Cl. 424-283.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,256,879, Cl. 542-427.000.
Cleveland, James P.: *See*—
Vanderbilt, Jeffrey J.; Gose, William C.; and Cleveland, James P., 4,256,888, Cl. 544-334.000.
Cliff, Michael J.; Cross, William T.; and Ramshaw, Colin, to Imperial Chemical Industries Limited. Electrolytic process. 4,256,551, Cl. 204-98.000.
Clontz, Norvin A.: *See*—
Russell, Edwin L.; and Clontz, Norvin A., 4,256,459, Cl. 8-471.000.
CMI Corporation: *See*—
Rowe, Murray A.; Conway, Robert T.; Glesmann, Herbert C.; and Kruse, Richard W., 4,256,415, Cl. 404-116.000.
Coaton, James R.; Rees, John M.; and Rothon, Roger N., to Thorn Lighting Limited; and Imperial Chemical Industries Limited. Incandescent halogen lamp with protective envelope coating. 4,256,988, Cl. 313-221.000.
Cobb, William R.: *See*—
Barthe, Henry P.; and Cobb, William R., 4,256,186, Cl. 173-23.000.
Coccia, Larry A., to Pullman Incorporated. Bottom cooling arrangement for reduction apparatus. 4,256,290, Cl. 266-191.000.
Cochran, Robert W. Heat pump water heater. 4,255,936, Cl. 62-238.700.
Coflexip: *See*—
Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, 4,256,146, Cl. 138-111.000.
Cohen, Jerome M., to Lubrizol Corporation, The. Oxidatively coupled hydroxyaromatic compounds and fuels and lubricants containing them. 4,256,596, Cl. 252-52.00R.
Cohen, Kenneth W., to Aerco International, Inc. Heat-reclaiming system. 4,256,176, Cl. 165-76.000.
Cohen, Louis, to B. F. Goodrich Company, The. Polymerization reactors coated with polymer-inhibitor complexes. 4,256,864, Cl. 526-62.000.
Cohen, Samuel W.; and Infantino, Settimio, to Velotron Machine Corp. Cornea-examining instrument. 4,256,385, Cl. 351-13.000.
Coless, Thomas L.: *See*—
Baumann, Stephen F.; Nakabayashi, Masahiro; Uttrachi, Gerald D.; Coless, Thomas L.; and Levine, Ernest N., 4,256,949, Cl. 219-146.240.
Colgate-Palmolive Company: *See*—
Epstein, Morton B.; and Gerecht, John F., 4,256,664, Cl. 564-177.000.
Colla, Dan P. Battery terminal post cleaning tool. 4,255,828, Cl. 15-236.00R.
Colles, Joseph H., to Hughes Aircraft Company. Wideband linear video contrast control. 4,257,064, Cl. 358-169.000.
Collett, Kenneth R.; and Hansen, LeRoy C. Method for rapidly igniting combustible material on a field. 4,256,086, Cl. 126-271.20C.
Colley, Jacques: *See*—
Klamandt, Herbert F.; and Colley, Jacques, 4,256,235, Cl. 220-4.00F.
Collins, Donald G.: *See*—
Coward, Noel D.; Collins, Donald G.; and Gambling, Kenneth H., 4,256,133, Cl. 137-78.300.
Collura, Peter C.: *See*—
Goda, Boyd D.; Simpson, Thomas E.; St. Vincent, Craig J.; and Collura, Peter C., 4,256,025, Cl. 493-160.000.
Colvin, David P.: *See*—
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P., 4,256,098, Cl. 128-133.000.
Commissariat a l'Energie Atomique: *See*—
Campillo, Louis; and Nicolas, Gerard, 4,255,853, Cl. 29-843.000.
Communications Patents Limited: *See*—
Birt, David R.; and Brandhuber, John A., 4,257,123, Cl. 455-115.000.
Compagnie Generale des Etablissements Michelin: *See*—
Chautard, Jean; and Chemizard, Andre, 4,256,158, Cl. 152-330.0RF.
Compagnie Generale des Matieres Nucleaires (Cogema): *See*—
Lyaudet, Georges; and Vial, Jean, 4,256,702, Cl. 423-7.000.
Compagnie Internationale pour l'Informatique: *See*—
Giraud, Georges; and Mollier, Jean, 4,256,955, Cl. 235-380.000.
Prieur, Lucien; and Pinard, Patrick, 4,256,297, Cl. 271-207.000.
Compton, Donald R., to ACF Industries, Incorporated. Crashworthy fuel pump improvement. 4,256,020, Cl. 92-102.000.
ComTec Corporation: *See*—
Ealy, David A., 4,255,883, Cl. 37-83.000.
Concrete Safety Equipment, Inc.: *See*—
Hatcher, Cecil W., 4,256,344, Cl. 299-39.000.
Connor, J. Franklin. Dust confining and collection housing for power table saws and the like. 4,255,995, Cl. 83-100.000.
Connors, Robert G. Stereoscopic viewer - booklet device. 4,256,367, Cl. 350-135.000.
Conoco, Inc.: *See*—
Bohannon, John M., 4,256,417, Cl. 405-195.000.

Conrad, Earl: *See*—
Jones, W. Richard; Hartman, Albert, Jr.; Conrad, Earl; and Kraig, Harry J., 4,255,928, Cl. 60-324.000.

Consolidated Controls Corporation: *See*—
Balhouse, Harold J., 4,256,284, Cl. 251-126.000.

Constructions Navales et Industrielles de la Mediterranee: *See*—
Brunet, Roger; and Marenco, Gerard, 4,256,049, Cl. 114-77.00R.

Continental Group, Inc., The: *See*—
Swaroop, Nareshwar; and Stone, Frederick L., 4,256,140, Cl. 137-561.00A.

Conway, Robert T.: *See*—
Rowe, Murray A.; Conway, Robert T.; Glesmann, Herbert C.; and Kruse, Richard W., 4,256,415, Cl. 404-116.000.

Cook, Jeffrey A.: *See*—
Rahnke, Christian J.; and Cook, Jeffrey A., 4,256,172, Cl. 165-8.000.

Cookson, Alan H.; and Bolin, Philip C., to Electric Power Research Institute, Inc. Method of manufacturing a welded joint in segmented sheath for compressed gas insulated transmission lines. 4,256,254, Cl. 228-166.000.

Copley, Russell D.; Schlueter, Francis E.; and Porter, Mark W., to Deere & Company. Cotton harvester with an offset head. 4,255,919, Cl. 56-30.000.

Corbett, Scott S., Jr.: *See*—
Clark, Clinton B., Jr.; Corbett, Scott S., Jr.; and VanDuyn, Allen E., 4,256,230, Cl. 212-216.000.

Corning Glass Works: *See*—
Carrier, Gerald B., 4,256,722, Cl. 423-594.000.

Cornwell, Dean F., to United Technologies Corporation. Apparatus for monitoring the optical quality of a beam of radiation. 4,256,958, Cl. 250-233.000.

Cotrell, Phillip L.: *See*—
Egan, Richard R.; and Cotrell, Phillip L., 4,256,611, Cl. 252-548.000.

Coussot, Gerard; Menager, Olivier; and Van Den Driessche, Michel, to Thomson-CSF. Elastic surface wave filter. 4,257,021, Cl. 333-195.000.

Cover, Walter E., to C. R. Bard, Inc. Membrane oxygenator. 4,256,692, Cl. 422-46.000.

Coward, Noel D.; Collins, Donald G.; and Gambling, Kenneth H. Watering valve device. 4,256,133, Cl. 137-78.300.

Cowart, William L.; Holland, Cropper W., Jr.; and Scarbrough, Don R., Sr., to Lockheed Corporation. Missile launcher for aircraft. 4,256,012, Cl. 89-1.816.

Cox, Robert D.: *See*—
Frank, Clyde W.; Nord, Paul J.; and Cox, Robert D., 4,256,462, Cl. 23-230.00R.

Coyne et Bellier, Bureau 'Ingenieurs Conseils: *See*—
Debreuille, Pierre-Jean, 4,255,975, Cl. 73-784.000.

CR Industries: *See*—
Larson, Ellis; and Olsson, Burton K., 4,256,315, Cl. 277-92.000.

Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck & Co., Inc. 4-Substituted-3-hydroxy-3-pyrroline-2,5-dione inhibitors of glycolic acid oxidase. 4,256,758, Cl. 424-274.000.

Crawford, John G., to General Electric Company. Mechanically operated level control for dishwashers. 4,256,136, Cl. 137-387.000.

Crews, Sam T.: *See*—
Bolton, Jimmie B.; and Crews, Sam T., 4,256,518, Cl. 148-127.000.

Crombach Investment Company S.A.: *See*—
Demulder, Andre E. V., 4,255,835, Cl. 17-76.000.

Cross, William T.: *See*—
Cliff, Michael J.; Cross, William T.; and Ramshaw, Colin, 4,256,551, Cl. 204-98.000.

Crowley, Donald J.; and McLaughlin, Jimmy E., to American Hospital Supply Corporation. Back opening surgical gown. 4,255,818, Cl. 2-51.000.

Crump, Robert F. Heat exchanger. 4,256,170, Cl. 165-1.000.

Crystal Systems Inc.: *See*—
Schmid, Frederick, 4,256,079, Cl. 125-17.000.
Schmid, Frederick; and Khattak, Chandra P., 4,256,530, Cl. 156-600.000.

Csanky, Geza: *See*—
Piliavin, Michael A.; and Csanky, Geza, 4,256,382, Cl. 350-334.000.

Csapo, Michael A., to Selas Corporation of America. Calciner screw construction. 4,256,453, Cl. 432-235.000.

Cuk, Slobodan M., to California Institute of Technology. DC-to-DC switching converter with zero input and output current ripple and integrated magnetics circuits. 4,257,087, Cl. 363-16.000.

Cullis, Herbert M.: *See*—
Lamadrid, Rene G.; and Cullis, Herbert M., 4,256,442, Cl. 417-477.000.

Cundell, Anthony M.: *See*—
Findl, Eugene; and Cundell, Anthony M., 4,256,832, Cl. 435-6.000.

Curtis, Stephen N.; and Bhargava, Hridaya N., to Beecham, Inc. Oral Compositions. 4,256,731, Cl. 424-54.000.

Cutler, Christopher A.: *See*—
Wallace, William D.; Cutler, Christopher A.; Clark, Justin S.; and Farr, Frederick L., 4,256,461, Cl. 23-230.00B.

D. W. Zimmerman Mfg., Inc.: *See*—
Dwyer, Robert E., 4,256,429, Cl. 414-626.000.

Dachs, Norman W., to Hooker Chemicals & Plastics Corp. Polyester compositions of enhanced tensile strength on ageing. 4,256,625, Cl. 260-40.00R.

Dai Nippon Tokyo Co., Ltd.: *See*—
Yokoyama, Sigeaki; Toyoda, Tsunehiko; and Okamura, Noriaki, 4,256,493, Cl. 106-22.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Uno, Hitoshi; Nagai, Yasutaka; Hino, Katsuhiko; and Nakamura, Hideo, 4,256,753, Cl. 424-263.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Ohtani, Masami, 4,256,398, Cl. 354-320.000.
Sakamoto, Takashi, 4,257,072, Cl. 358-298.000.

Dal Nippon Tokyo Co., Ltd.: *See*—
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,256,805, Cl. 428-357.000.

Dale, Robert W.; and Rooney, John J., to Gallaher Limited. Catalysts. 4,256,609, Cl. 252-455.00Z.

Daniel, Peter J., to U.S. Philips Corporation. Method of manufacturing solid-state devices in which planar dimensional distortion is reduced. 4,256,829, Cl. 430-312.000.

Daniljuk, Valery V.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Dannelly, Clarence C., to Eastman Kodak Company. Pellet coating process. 4,256,785, Cl. 427-222.000.

Dantzer, Elonne: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Dantzer, Elonne, 4,255,894, Cl. 46-169.00A.

Dataproducts Corporation: *See*—
Wolf, Peter H.; and Slade, Boyd E., 4,256,948, Cl. 219-121.0LE.

Davenport, Anthony T.: *See*—
Waid, George M.; and Davenport, Anthony T., 4,256,517, Cl. 148-36.000.

David Kopf Instruments: *See*—
Kopf, J. David; Seiler, William, Jr.; Palecki, Gerald S.; and Kaufman, Howard H., 4,256,112, Cl. 128-303.00B.

Davidson, James V., to Honeywell Inc. Eccentric rotary valve with control-improving wing member. 4,256,285, Cl. 251-283.000.

Davis, Burns; Barbee, Robert B.; and Musser, Harry R., to Eastman Kodak Company. Copolyetheresters. 4,256,860, Cl. 525-437.000.

Davis, Burns; and Barbee, Robert B., to Eastman Kodak Company. Process for producing polyetherester elastomer. 4,256,861, Cl. 525-437.000.

Davis, James P., to Keystone Consolidated Industries, Inc. Improved strap guide system. 4,256,032, Cl. 100-26.000.

Davis, Paul K., to Pacific Roller Die Co., Inc. Method and apparatus for removing camber from strip. 4,255,999, Cl. 83-367.000.

Davydenko, Nikolai M.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.

Davydov, Vadim A.; Khromov, Vladimir I.; Kogos, Aizik M.; Rymarenko, Leonid I.; Makeev, Igor M.; and Pasechnik, Nikolai V. Machine for multidie nonslip drawing of wire products. 4,255,957, Cl. 72-279.000.

Dawless, Robert K., to Aluminum Company of America. Silicon purification method. 4,256,717, Cl. 423-348.000.

Day, Claude. Nail head drilling guide. 4,256,420, Cl. 408-115.00R.

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DeAmicis, Gene E.: *See*—
Woodlief, Frederick E.; and DeAmicis, Gene E., 4,256,937, Cl. 200-144.00R.

Debaigt, Jean, to Societe Anonyme dite: CGEE Alsthom. Rapid-connection terminal. 4,256,360, Cl. 339-97.00R.

Deborde, Albert H., to Saurer - Diederichs Societe Anonyme. Weaving loom. 4,256,147, Cl. 139-115.000.

Deborski, Gary A., to Dow Chemical Company, The. Method of oxygen electrode preparation and product thereof. 4,256,545, Cl. 204-290.00R.

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de Bruin, Jan; and Klomp, Joseph H., to Koninklijke Fabriek Inventum Fabriek van instrumenter en elektrische apparaten N.V. Device for making coffee or the like. 4,256,030, Cl. 99-295.000.

De Candia, Ettore. Car body welding assembly system. 4,256,947, Cl. 219-79.000.

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Deere & Company: *See*—
Copley, Russell D.; Schlueter, Francis E.; and Porter, Mark W., 4,255,919, Cl. 56-30.000.

Degen, Hans-Juergen; Feichtmayr, Franz; and Grychtol, Klaus, to BASF Aktiengesellschaft. Methine dyes for paper and amonically-modified fibers. 4,256,458, Cl. 8-506.000.

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Dias, Gil M.; and Delasanta, Armando C., 4,256,786, Cl. 427-244.000.

de Launay, Paul. Check valve. 4,256,137, Cl. 137-496.000.

Dellepiane, Enrico; Ricci, Roberto; and Timossi, Giovanni. Three-positions sliding gate valve. 4,256,291, Cl. 266-272.000.

DEMAG, Aktiengesellschaft: *See*—
Kothe, Dieter, 4,256,168, Cl. 164-444.000.

De Martino, Dominick, to Spencer Turbine Company, The. Filter bag attaching means. 4,256,473, Cl. 55-379.000.

Demozay, Daniel: *See*—
Guigues, Francois; Mourier, Jacqueline; and Demozay, Daniel, 4,256,480, Cl. 71-88.000.

Demulder, Andre E. V., to Crombach Investment Company S.A. Device for opening shell-fish. 4,255,835, Cl. 17-76.000.

Den-Mat, Inc.: *See*—
Ibsen, Robert L.; and Glace, William R., 4,256,603, Cl. 252-182.000.

de Nevers, Noel H.: *See*—
Gardner, James H.; and de Nevers, Noel H., 4,255,944, Cl. 62-457.000.

Denton, Dean A., to W. R. Grace & Co. Method of preparing silica gel pellets. 4,256,682, Cl. 264-109.000.

Denzinger, Wolfgang: *See*—
Kroger, Hans; Muller, Wolfgang; and Denzinger, Wolfgang, 4,257,090, Cl. 363-65.000.

De Remigis, Joseph, to Sentrol Systems Ltd. Feedback color control system. 4,256,131, Cl. 137-3.000.

Deschamps, Rene G., to Societe Anonyme de Telecommunications. Magnetostrictive rod filters. 4,257,022, Cl. 333-201.000.

Deseret Automotive Research, Inc.: *See*—
Casull, Don C., 4,256,071, Cl. 123-266.000.

Desiderio, Fred A.: *See*—
Larsson, Bjorn E.; and Desiderio, Fred A., 4,256,809, Cl. 428-473.000.

Desmond, John W. Plastic dispenser for labels. 4,256,237, Cl. 221-26.000.

Detjen, Heinrich W.: *See*—
Gutermuth, Paul F.; and Detjen, Heinrich W., 4,256,092, Cl. 126-449.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Note frequency generator for an electronic musical instrument. 4,256,003, Cl. 84-1.010.

Deutsche Babcock Aktiengesellschaft: *See*—
Noack, Rolf; and Gramelt, Stefan, 4,256,606, Cl. 252-411.00R.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
von Bebenburg, Walter; Schulmeyer, Norbert; and Szelenyi, Istvan, 4,256,752, Cl. 424-263.000.

Devensky, Walter L.: *See*—
Kirner, Ernest O.; and Devensky, Walter L., 4,257,031, Cl. 340-149.00R.

DeVincent, Patsy: *See*—
Sullivan, Leo S., Jr.; and DeVincent, Patsy, 4,256,292, Cl. 267-8.00R.

Dewey, John L.: *See*—
Scott, Charles E.; and Dewey, John L., 4,256,714, Cl. 423-295.000.

de Wied, David; and Greven, Hendrik M., to Akzona Incorporated. Psychopharmacological peptides. 4,256,736, Cl. 424-177.000.

Diamond Shamrock Corporation: *See*—
Bennett, John E.; and Elliott, Joseph E., 4,256,556, Cl. 204-147.000.
Papalos, John G.; and Kavchok, Ronald W., 4,256,871, Cl. 528-265.000.

Dias, Gil M.; and Delasanta, Armando C., to United States of America, Army. Chemical protective, fire resistant composition. 4,256,786, Cl. 427-244.000.

Dickerson, Charles G.: *See*—
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, 4,256,818, Cl. 430-39.000.

Dierickx, Edward G.: *See*—
Smith, Tommy L.; Dierickx, Edward G.; Schade, Walter B., Jr.; and Pete, Leslie A., 4,256,304, Cl. 273-60.00B.

Dieringer, Andrew M., to Rexnord Inc. Proportional controller. 4,256,040, Cl. 104-17.00R.

Dietrich, Hagen; and Fane, William J., to Norris Industries, Inc. Combination spring/dead bolt lock. 4,255,953, Cl. 70-107.000.

Dietrich, Rolf; Hafner, Heinz; and Pecher, Wolfgang, to Metz Apparatewerk Inh. Paul Metz. Electronic flash attachment for cameras, provided with plural circuits for differing camera types and a removable connector module. 4,256,393, Cl. 354-145.000.

Dietsche, Thomas J.; and Love, Jim, to Dow Chemical Company, The. Preparation of chlorinated pyridines. 4,256,894, Cl. 546-345.000.

Dietz, Russell N.; and Senum, Gunnar I., to United States of America, Energy. Perfluorocarbon vapor tagging of blasting cap detonators. 4,256,038, Cl. 102-28.00R.

Diez, L. J. Thermoweld insertion device. 4,255,843, Cl. 29-256.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Process for preparing layered organophosphorus inorganic polymers. 4,256,872, Cl. 528-395.000.

Dijkstra, Durk, to Rontgen Technische Dienst B.V. Device for the inspection of welds. 4,255,972, Cl. 73-634.000.

Dinelli, Dino. Converting rotary motion into variable-amplitude reciprocation. 4,255,989, Cl. 74-831.000.

Dines, Martin B.: *See*—
DiGiacomo, Peter M.; and Dines, Martin B., 4,256,872, Cl. 528-395.000.

Diskus, Alfred: *See*—
Wittmann, Erwin; Diskus, Alfred; and Auer, Engelbert, 4,256,482, Cl. 71-92.000.

Ditgens, Klaus: *See*—
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,256,740, Cl. 424-200.000.

Divisek, Jiri; and Mergel, Jurgen, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Hybrid process for producing hydrogen. 4,256,549, Cl. 204-60.000.

Dixit, Shyam N. S.; Bain, Douglas I.; and Carter, David A., to Chemed Corporation. Fly ash collection. 4,256,703, Cl. 423-23.000.

Dixon, William. Shoe holder adapters for stiff platform. 4,255,822, Cl. 3-4.000.

Doan, Obe O. Ratchet-action end wrench without ratchet. 4,255,990, Cl. 81-179.000.

Dobbins, Edward C. Tennis practice device. 4,256,303, Cl. 273-29.00A.

Dobson Park Industries Limited: *See*—
Phillips, Reginald A., 4,256,145, Cl. 138-31.000.

Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG: *See*—
Schindler, Johannes G.; and Schal, Wilfried, 4,256,561, Cl. 204-195.00M.

Dr.-Ing. Rudolf Hell GmbH, Firma: *See*—
Lindemann, Eckhard; Broning, Jorg; and Asbach, Dietrich, 4,257,042, Cl. 340-716.000.

Dr.-Ing. Rudolf Hell GmbH, Firma: *See*—
Sommer, Rudiger; and Wischer, Hermann, 4,257,070, Cl. 358-282.000.

Dodd, Thomas F.: *See*—
Rutner, Herman; and Dodd, Thomas F., 4,256,724, Cl. 424-1.000.
Rutner, Herman; and Dodd, Thomas F., 4,256,725, Cl. 424-1.000.

Donaldson, Raymond E.: *See*—
Carver, Bobby C.; and Donaldson, Raymond E., 4,256,589, Cl. 252-8.700.

Donatelli, Paul C.: *See*—
Peirson, Robert C.; Vanada, James R.; and Donatelli, Paul C., 4,257,093, Cl. 364-105.000.

Dornier System GmbH: *See*—
Kroger, Hans; Muller, Wolfgang; and Denzinger, Wolfgang, 4,257,090, Cl. 363-65.000.

Doubrava, James H.; and Thellmann, Edward L., to Gould Inc. High conductivity titanium electrode. 4,256,810, Cl. 428-550.000.

Dougherty, William E. Universal positioning support for grinder wheels. 4,255,904, Cl. 51-35.000.

Dow Chemical Company, The: *See*—
Atchison, Hugh C.; and Simmons, Bobby G., 4,256,511, Cl. 134-46.000.
Chamberlin, Thomas A.; and Tomalia, Donald A., 4,256,855, Cl. 525-326.000.
Deborski, Gary A., 4,256,545, Cl. 204-290.00R.
Dietsche, Thomas J.; and Love, Jim, 4,256,894, Cl. 546-345.000.
Malhotra, Sudarshan K.; and Ricks, Michael J., 4,256,893, Cl. 546-301.000.
Martin, Patrick H.; Schrader, Paul G.; and Stringham, Robert R., 4,256,844, Cl. 521-59.000.
Smith, Harry A., 4,256,622, Cl. 260-33.20R.
Steiner, Edwin C.; and Vrieland, G. Edwin, 4,256,895, Cl. 546-345.000.
Woo, Edmund P., 4,256,859, Cl. 525-384.000.
Zweigle, Maurice L.; and Hickman, Janet C., 4,256,505, Cl. 106-171.000.

Down, Michael G., to Westinghouse Electric Corp. Hydrogen meter for liquid lithium. 4,255,963, Cl. 73-19.000.

Dozier, Alfred R. Chemical vapor reaction system. 4,256,053, Cl. 118-728.000.

Dragerwerk Aktiengesellschaft: *See*—
Warncke, Ernst, 4,256,698, Cl. 422-122.000.

Dresser Industries, Inc.: *See*—
Langford, James W., Jr., 4,256,351, Cl. 308-8.200.

DRG Limited: *See*—
LeBlanc, Conrad, 4,256,250, Cl. 227-17.000.

Dryden, Gale E. Two-tube resuscitation system. 4,256,099, Cl. 128-200.260.

Dubiel, Oswald; and Pretzel, Dieter, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,256,210, Cl. 192-99.00A.

Dubois, Jean-Claude: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,256,656, Cl. 260-465.00D.

Ducasse, Joseph C. V. Continuous separation system. 4,256,582, Cl. 210-297.000.

Duckworth, Lawrence L. Mulch loosening rake. 4,256,185, Cl. 172-621.000.

Dudar, Erzsebet: *See*—
Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, 4,256,481, Cl. 71-88.000.

Duel, Don M., to Motorola, Inc. Powered gimbal system. 4,256,279, Cl. 248-184.000.

Duffus, Robert H.: *See*—
Tsai, Yih-Wan; and Duffus, Robert H., 4,256,173, Cl. 165-9.300.

Dufrane, Keith F.; and Snediker, David K., to Battelle Development Corporation. Adherent crack gauge. 4,255,974, Cl. 73-776.000.

Dujardin, Francois: *See*—
Tytgat, Daniel; Degols, Albert; and Dujardin, Francois, 4,256,542, Cl. 204-1.00T.

Dumont, Marcel: *See—*
Gabriel, Jean P.; Dumont, Marcel; and Guille, Robert, 4,256,875, Cl. 536-4.000.

Dunahoo, Edmond A., to Fiber Science, Inc. Continuous filament apex fittings and methods of manufacture thereof. 4,255,836, Cl. 24-122.600.

Dunchock, Richard S., to SL Container Corporation. Lockable storage compartment and seat for vehicles. 4,256,340, Cl. 296-24.00R.

Dunkleberger, La Rue N., to Bell Telephone Laboratories, Incorporated. Mask structure for depositing patterned thin films. 4,256,816, Cl. 430-11.000.

Dunstan, Edwin R., Jr., to United States of America, Interior. Fly ash-based cement. 4,256,504, Cl. 106-109.000.

Du Pont de Nemours, E. I., and Company: *See—*
Haire, Michael J., 4,256,742, Cl. 424-244.000.
Hoehn, Harvey H.; and Toy, Stephen T., 4,256,588, Cl. 210-692.000.
Smith, Dewey H., Jr., 4,256,755, Cl. 424-272.000.

Durango Systems, Inc.: *See—*
Lesea, Ronald A.; Luttge, Barrie; and Lesea, Austin H., 4,256,928, Cl. 179-18.0BE.

Durette, Philippe L.; and Shen, Tsung-Ying, to Merck & Co., Inc. Immunologically active dipeptidyl saccharides and methods of preparation. 4,256,735, Cl. 424-177.000.

Duro Test Corporation: *See—*
Trutner, Donald G.; Kovacs, David; Fontana, Raymond P.; and Thorington, Luke, 4,256,989, Cl. 313-318.000.

Dwyer, Robert E., to D. W. Zimmerman Mfg., Inc. Apparatus for handling signature bundles. 4,256,429, Cl. 414-626.000.

Dyer, Paul N., to Air Products and Chemicals, Inc. Synthesis of olefinic oxides from olefin and oxygen. 4,256,649, Cl. 260-348.330.

Dynamit Nobel Aktiengesellschaft: *See—*
Junger, Hans; and Seiler, Claus-Dieter, 4,256,623, Cl. 260-38.000.

Dynatech Laboratories, Inc.: *See—*
Lancaster, Jesse F., 4,256,936, Cl. 200-51.070.

E-Systems, Inc.: *See—*
Flick, Edward A.; Holmes, Timothy R.; and Larson, Myles A., 4,256,275, Cl. 244-3.190.

Ealy, David A., to ComTec Corporation. Attitude control system. 4,255,883, Cl. 37-83.000.

Easco Tools, Inc.: *See—*
Biszantz, Donald W.; Landers, Russell H.; Sexton, James H.; and Iammarino, Dominic J., 4,256,156, Cl. 145-33.00A.

Eastman, James E.: *See—*
Tuschhoff, John V.; Eastman, James E.; and Schanefelt Robert V., 4,256,509, Cl. 127-32.000.

Eastman, James M., to Bendix Corporation, The. Differential area electrohydraulic doser actuator. 4,256,017, Cl. 91-417.00R.

Eastman Kodak Company: *See—*
Ahern, Douglas K., 4,256,298, Cl. 271-245.000.
Carver, Bobby C.; and Donaldson, Raymond E., 4,256,589, Cl. 252-8.700.
Dannelly, Clarence C., 4,256,785, Cl. 427-222.000.
Davis, Burns; Barbee, Robert B.; and Musser, Harry R., 4,256,860, Cl. 525-437.000.
Davis, Burns; and Barbee, Robert B., 4,256,861, Cl. 525-437.000.
Morris, Don L.; Gammans, William J.; and Holmes, Jerry D., 4,256,916, Cl. 562-537.000.
Popp, Gerhard; Saturno, Patrick H.; and Stephen, Keith H., 4,256,826, Cl. 430-213.000.
Simons, Michael J.; Southby, David T.; and Ling, Hans G., 4,256,881, Cl. 544-132.000.
Vanderbilt, Jeffrey J.; Gose, William C.; and Cleveland, James P., 4,256,888, Cl. 544-334.000.
Wang, Richard H. S.; and Zannucci, Joseph S., 4,256,626, Cl. 260-45.80N.
Webster, Frank G.; and Regan, Michael T., 4,256,819, Cl. 430-41.000.

Eastman Technology, Inc.: *See—*
McClure, Richard J., 4,256,781, Cl. 427-47.000.

Eaton Corporation: *See—*
Bradshaw, Cyril E., 4,256,076, Cl. 123-568.000.
Leinweber, Robert L., 4,256,327, Cl. 280-684.000.
Mueller, Robert S., 4,256,070, Cl. 123-198.00F.
Najer, Leonard M.; and Urban, John A., 4,256,208, Cl. 188-196.00D.

Ebauches Electroniques S.A.: *See—*
Freer, William G.; and Simon, Jean-Luc, 4,255,848, Cl. 29-592.00R.
Hubner, Kurt, 4,257,112, Cl. 368-11.000.

Ebauches S.A.: *See—*
Besson, Rene, 4,257,117, Cl. 368-69.000.
Meister, Rene; and Laesser, Claude, 4,257,113, Cl. 368-35.000.

Eberle, William J. Optic art kit novel extruded frame material. 4,255,873, Cl. 434-82.000.

Eberle, William J., to General Battery Corporation. Electrodes for use in the extrusion-fusion welding of lead parts through an aperture in a battery case. 4,256,946, Cl. 219-78.150.

Eckberg, Richard P., to General Electric Company. Solventless release compositions, methods and articles of manufacture. 4,256,870, Cl. 528-15.000.

Eckel, Oliver C. Mounting support blocks for pivotal rotor of wind turbine. 4,256,435, Cl. 415-2.00R.

Ecolaire Incorporated: *See—*
Boyer, Robert C.; and Williams, George J., 4,255,841, Cl. 29-157.400.

Edwards, Christopher J. C.: *See—*
Choksi, Pradip V.; Christoffel, William D.; and Edwards, Christopher J. C., 4,255,996, Cl. 83-140.000.

Edwards, Michael F.; and Williams, Edward, to GKN Sankey Limited. Road wheels. 4,256,349, Cl. 301-13.0SM.

Efinger, Arnold; and Moser, Erwin, to Wickmann-Werke Boblingen GmbH. Electrical control device for high and low voltage installations. 4,256,938, Cl. 200-144.00B.

Efron, Incorporated: *See—*
Agcaoili, Clarito R., 4,256,164, Cl. 160-186.000.

Egan, Richard R.; and Cotrell, Phillip L., to Sherex Chemical Company, Inc. Light duty non-irritating detergent compositions. 4,256,611, Cl. 252-548.000.

Egner, Carolyn A.: *See—*
Egner, Elmer A., 4,256,295, Cl. 269-45.000.

Egner, Elmer A., to Egner, Elmer A.; Anton, Leonard M.; and Egner, Carolyn A. Adjustable clamp. 4,256,295, Cl. 269-45.000.

Ehrlich, Richard. Atmospheric water collector. 4,255,937, Cl. 62-264.000.

Eich, Richard A.: *See—*
Strobel, Rudolf G. K.; and Eich, Richard A., 4,256,774, Cl. 426-428.000.

Eichner, Walter: *See—*
Kern, Johann; and Eichner, Walter, 4,256,440, Cl. 417-391.000.

Eikonix Corporation: *See—*
Lianza, Thomas A., 4,256,969, Cl. 250-566.000.

Eisai Co., Ltd.: *See—*
Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, 4,256,765, Cl. 424-315.000.

Eitel, Kurt: *See—*
Goebel, Hermann; and Eitel, Kurt, 4,256,634, Cl. 260-149.000.

Ekstrom, Stig O. M., to Handelsbolaget Evaksystem Ekstrom & Co. Method for the manufacture of a pipe. 4,256,523, Cl. 156-190.000.

Eldin, Sameer H.; and Stockinger, Friedrich, to Ciba-Geigy Corporation. Novel vinyl ethers, process for their preparation, and their use for the preparation of polymers. 4,256,867, Cl. 526-263.000.

Elecompack Company Ltd.: *See—*
Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,256,355, Cl. 312-198.000.

Electric power Research Institute, Inc.: *See—*
Balhouse, Harold J., 4,256,284, Cl. 251-126.000.
Cookson, Alan H.; and Bolin, Philip C., 4,256,254, Cl. 228-166.000.
Ferro, Armand P.; and Temple, Victor A. K., 4,257,058, Cl. 357-30.000.
Garzon, Ruben D.; McConnell, Lorne D.; and Votta, Gerald A., 4,256,939, Cl. 200-147.00R.

Elettromeccanica Mausoli S.r.l.: *See—*
Magnani, Carla, 4,255,900, Cl. 49-141.000.

Elger, Walter: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,256,745, Cl. 424-248.550.

Eling, Thomas E.: *See—*
Bend, John R.; Eling, Thomas E.; and McKinney, James D., 4,256,646, Cl. 260-345.80P.

Ellestad, Raymond A., to Bourns Medical Systems, Inc. Thermistor assist sensing. 4,256,101, Cl. 128-204.230.

Elliott, Joseph E.: *See—*
Bennett, John E.; and Elliott, Joseph E., 4,256,556, Cl. 204-147.000.

Elsbett, Gunter: *See—*
Elsbett, Ludwig; and Elsbett, Gunter, 4,256,022, Cl. 92-190.000.

Elsbett, Ludwig; and Elsbett, Gunter. Piston for reciprocating internal combustion engines, typically diesel engines. 4,256,022, Cl. 92-190.000.

Elsner, Emil: *See—*
Schwabe, William E.; Elsner, Emil; and Kasper, Rudolph, 4,256,918, Cl. 13-11.000.

Eltra Corporation: *See—*
Kern, Calvin V., 4,255,982, Cl. 74-7.00R.

Emanuel, Nikolai M.: *See—*
Bljumberg, Erna A.; Maslov, Sergei A.; Emanuel, Nikolai M.; Merzhanov, Alexandr G.; and Borovinskaya, Inna P., 4,256,650, Cl. 260-348.330.

Embree, David G. Actuator system for aircraft control surfaces. 4,256,277, Cl. 244-213.000.

Emerald, Paul R.: *See—*
Miles, Steven W.; and Emerald, Paul R., 4,256,515, Cl. 148-1.500.

Emerson Electric Co.: *See—*
Hochstatter, Brian R.; and Groya, George J., 4,256,155, Cl. 142-7.000.
Ou, Sam A., 4,255,939, Cl. 62-324.00A.

Endo, Norio: *See—*
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.

Energy Concerns, Inc.: *See—*
Roggow, Mervin A.; and Stiver, J. Harold, 4,256,059, Cl. 122-32.000.

Energy Development Associates, Inc.: *See—*
Bjorkman, Harry K., Jr., 4,256,554, Cl. 204-128.000.

Engebretson, Mark E., to Paramount Sound Systems Corporation. Method and system of controlling sound and effects devices by a film strip. 4,256,389, Cl. 352-11.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Bartholic, David B., 4,256,567, Cl. 208-252.000.

Engelhardt, Gunther: *See*—
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,256,747, Cl. 424-250.000.
Engineering Enterprises, Inc.: *See*—
Fox, Fred K.; and Tomek, Martin L., 4,256,189, Cl. 175-40.000.
Engleman, Elmer F. Device for supplying outside combustion air to a fireplace. 4,256,084, Cl. 126-121.000.
Enomoto, Takamichi; Katoh, Tatuya; Kozima, Akio; and Satoh, Tatsumi, to Ricoh Company, Ltd. Electrophotographic element with carbazole-phenyhydrazone charge transport layer. 4,256,821, Cl. 430-59.000.
Envirotech Corporation: *See*—
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,256,553, Cl. 204-106.000.
Braemer, Frank C., 4,256,466, Cl. 48-197.00R.
Epstein, Morton B.; and Gerecht, John F., to Colgate-Palmolive Company. Substantive sunscreen agents. 4,256,664, Cl. 564-177.000.
Equipment Manufacturing, Inc.: *See*—
Burgess, Leonard G.; and Wroblewski, Richard E., 4,256,425, Cl. 410-149.000.
Erhardt, Peter F.: *See*—
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, 4,256,818, Cl. 430-39.000.
Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Phenoxy alkylamides. 4,256,767, Cl. 424-324.000.
Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,255,846, Cl. 29-407.000.
Etat Francais represente par le Delegue General Pour l'Armement: *See*—
Besson, Raymond J., 4,257,020, Cl. 333-187.000.
Etoh, Yukihiro: *See*—
Sugasawa, Fukashi; and Etoh, Yukihiro, 4,256,074, Cl. 123-440.000.
Eubanks Engineering Co.: *See*—
Patel, Jayantilal S., 4,256,427, Cl. 414-77.000.
Evans, Dwight L., Jr. Apparatus for centrifugal casting. 4,256,167, Cl. 164-298.000.
Exxon Research & Engineering Co.: *See*—
Grymonprez, Paul A.; Ruyssers, Robert H. M.; and Barker, Brian G., 4,255,967, Cl. 73-168.000.
Naslund, Lars A.; and Laskin, Allen I., 4,256,590, Cl. 252-8.55D.
Schlosberg, Richard H.; and Scouten, Charles G., 4,256,568, Cl. 208-263.000.
F. L. Smidth & Co.: *See*—
Hansen, Ib; and Gommesen, Hans, 4,256,264, Cl. 241-72.000.
F.lli Marzoli & C. S.p.A.: *See*—
Marzoli, Angelo, 4,255,925, Cl. 57-304.000.
Marzoli, Angelo, 4,256,202, Cl. 184-7.00A.
F. T. Read & Sons, Inc.: *See*—
Read, James L., 4,256,572, Cl. 209-257.000.
Fahrbach, Rudolf, to Universal Manufacturing Co., Inc. Coil winding machine to wind saddle-shaped coils. 4,256,268, Cl. 242-7.110.
Fairchild Camera and Instrument Corp.: *See*—
Herndon, William H., 4,257,059, Cl. 357-46.000.
Fairchild Incorporated: *See*—
Black, Sigmund; Lagowski, Joseph V.; Whitt, Jerry C.; and Plumley, Roger D., 4,256,343, Cl. 299-31.000.
Fandrey, Peter; and Muller, Hermann, to SIHI GmbH & Co. KG. Self-priming pump. 4,256,436, Cl. 415-143.000.
Fane, William J.: *See*—
Dietrich, Hagen; and Fane, William J., 4,255,953, Cl. 70-107.000.
Farr, Frederick L.: *See*—
Wallace, William D.; Cutler, Christopher A.; Clark, Justin S.; and Farr, Frederick L., 4,256,461, Cl. 23-230.00B.
Farrell, Robert E., to Package Machinery Company. Injection molding machine with regenerative feed system. 4,256,447, Cl. 425-159.000.
Fauvel, Gunter, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Coaxial heat exchanger and method for constructing a heat exchanger. 4,256,178, Cl. 165-165.000.
Favrou, John M.: *See*—
Brooks, Steven W.; and Favrou, John M., 4,256,996, Cl. 318-7.000.
Fayemi, Alfred: *See*—
Ali, Majid; Nalebuft, Donald; Fayemi, Alfred; Ramanarayanan, Madhava P.; and Mesa-Tejada, Ricardo, 4,256,833, Cl. 435-7.000.
Fechalos, William A.: *See*—
Pitroda, Satyan G.; Fechalos, William A.; and Stehman, Carl J., 4,256,926, Cl. 179-18.0ES.
Feichtmayr, Franz: *See*—
Degen, Hans-Juergen; Feichtmayr, Franz; and Grychtol, Klaus, 4,256,458, Cl. 8-506.000.
Feighery, James M.; and Howden, Dwight E., to Tex-Del, Inc. Carpet roll forming apparatus and method. 4,256,269, Cl. 242-66.000.
Feniak, George: *See*—
Buckler, Ernest J.; and Feniak, George, 4,256,857, Cl. 525-331.000.
Ferro, Armand P.; and Temple, Victor A. K., to Electric Power Research Institute, Inc. Package for radiation triggered semiconductor device and method. 4,257,058, Cl. 357-30.000.
Ferro Corporation: *See*—
Burton, Gordon D., 4,256,044, Cl. 110-104.00R.
Fiat-Allis Macchine Movimetno Terra S.p.A.: *See*—
Barbagli, Rino O., 4,256,144, Cl. 137-636.200.
Fiat Societa per Azioni: *See*—
Brusaglino, Giampiero; and Peri, Giorgio, 4,256,997, Cl. 318-254.000.
Fiber Science, Inc.: *See*—
Dunahoo, Edmond A., 4,255,836, Cl. 24-122.600.
Fickert, Werner: *See*—
Maurer, Manfred; Orth, Winfried; and Fickert, Werner, 4,256,892, Cl. 546-261.000.
Field, George F.; and Zally, William J., to Hoffmann-La Roche Inc. Intermediates for the production of imidazobenzodiazepines. 4,256,637, Cl. 260-239.0BD.
Field, Sydney J.: *See*—
Magill, Robert J.; and Field, Sydney J., 4,256,143, Cl. 137-601.000.
Fields, Donald R.: *See*—
Havens, Marvin R.; Fields, Donald R.; and Miller, Douglas J., 4,256,317, Cl. 277-112.000.
Filka, Judit: *See*—
Blickle, Tibor; Komaromy, Zsigmond; Filka, Judit; Gyenis, Janos; and Borlai, Oszkar, 4,256,576, Cl. 62-538.000.
Findl, Eugene; and Cundell, Anthony M., to BioResearch Inc. Carcinogen and mutagen screening method and apparatus. 4,256,832, Cl. 435-6.000.
Finite Filter Company, Inc.: *See*—
Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,256,474, Cl. 55-482.000.
Finkelshtein, Leonid I.: *See*—
Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M., 4,256,709, Cl. 423-119.000.
Finley, Michael J., to Sherwood Medical Industries Inc. Fluid sample collection device. 4,256,120, Cl. 128-764.000.
Fischer, Edgar; Brandrup, Johannes; and Weinlich, Jurgen, to Hoechst Aktiengesellschaft. Polymerization of vinylic monomer in presence of benzothiazol-hydrazones. 4,256,854, Cl. 525-242.000.
Fischer, George A.; and Prohl, Melvin A., to General Electric Company. Self-aligning bearing. 4,256,353, Cl. 308-26.000.
Fischer, Robert T., to Miner Enterprises, Inc. Railway hopper car sliding gate lock. 4,256,042, Cl. 105-282.00P.
Fisher, Gary J.; Morean, James E.; Simmons, Perley F.; and Van-Gorden, Steven N., to GTE Products Corporation. Cathode ray tube screen exposure system. 4,256,390, Cl. 354-1.000.
Fjarlie, Earl J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Scanning spectrometer. 4,256,405, Cl. 356-346.000.
Flanders, Dale C.: *See*—
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., 4,256,787, Cl. 428-1.000.
Fleischer, Henry. Collapsible frames for baby carriers. 4,256,325, Cl. 280-649.000.
Flesher, Peter; and Johnson, Ian M., to Allied Colloids Limited. Sulphonated derivatives of acrylamide and their preparation. 4,256,660, Cl. 260-513.00N.
Flick, Edward A.; Holmes, Timothy R.; and Larson, Myles A., to E-Systems, Inc. Homing system and technique for guiding a missile towards a metal target. 4,256,275, Cl. 244-3.190.
Fluri, Peter; Voser, Richard; and Wettstein, Peter, to Inventa AG fur Forschung und Patentverwertung, Zurich. Gas collection apparatus. 4,256,837, Cl. 435-167.000.
Flynn, Charles M., Jr.; Carnahan, Thomas G.; and Lindstrom, Roald E., to United States of America, Interior. Selective removal of mercury from cyanide solutions. 4,256,707, Cl. 423-42.000.
Flynn, Charles M., Jr.: *See*—
Carnahan, Thomas G.; and Flynn, Charles M., Jr., 4,256,587, Cl. 210-670.000.
Foden, Peter J.: *See*—
Boyer, Adrian J.; Richardson, William R.; Metcalfe, Robert J.; and Foden, Peter J., 4,255,823, Cl. 5-81.00R.
Foidl, Gabriele: *See*—
Griengl, Herfried; and Foidl, Gabriele, 4,256,764, Cl. 424-285.000.
Foley, Robert G., to Thomas & Betts Corporation. Selective conductor severing tool. 4,255,857, Cl. 30-363.000.
Fomin, Georgy G.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.
Fontana, Raymond P.: *See*—
Trutner, Donald G.; Kovacs, David; Fontana, Raymond P.; and Thorington, Luke, 4,256,989, Cl. 313-318.000.
Fontanes, Sylvain: *See*—
Gonin, Roger B.; Fontanes, Sylvain; and Picquendar, Jean E., 4,257,019, Cl. 333-165.000.
Ford, Geoffrey E.; and Pantelides, Antis N., to T I Fords Limited. Bottle inspection apparatus. 4,256,957, Cl. 250-223.00B.
Ford Motor Company: *See*—
Gaerttner, Martin R.; and Hoffman, David W., 4,256,780, Cl. 427-38.000.
Geoffrey, James E., 4,256,330, Cl. 280-802.000.
Rahnke, Christian J.; and Cook, Jeffrey A., 4,256,172, Cl. 165-8.000.
Formato, Richard A., to Zoli, Theodore P., Jr. Apparatus and method for measuring the velocity of a moving dielectric material. 4,255,976, Cl. 73-861.080.
Forrester, Robert E., Jr.: *See*—
Turns, Earl W.; Forrester, Robert E., Jr.; and Porter, Arthur C., 4,256,547, Cl. 204-35.00N.
Forschirm, Alex S.: *See*—
Hannon, Martin J.; and Forschirm, Alex S., 4,256,232, Cl. 215-12.00R.

Forster, Rolf, to Bernhard Forster GmbH. Orthodontic bracket and orthodontic appliance. 4,256,455, Cl. 433-8.000.

Fortuna, Joseph J., to Western Electric Company, Inc. Method and apparatus for indelibly marking articles during a manufacturing process. 4,255,851, Cl. 29-827.000.

Foskem (Proprietary) Limited of "Wegsteek": *See—*
Burton, Phillip F.; and Hukki, Risto T., 4,256,267, Cl. 241-24.000.

Four Star Corporation: *See—*
Ingram, Charles E., 4,256,339, Cl. 296-1.00S.

Fox, Fred K.; and Tomek, Martin L., to Engineering Enterprises, Inc. Well drilling tool. 4,256,189, Cl. 175-40.000.

Fralish, Mark R., to J. I. Case Company. Adjustment mechanism for chute deflector. 4,255,881, Cl. 37-43.00R.

Franc, Jean: *See—*
Goldschild, Pierre H.; and Franc, Jean, 4,256,282, Cl. 251-58.000.

Frank, Clyde W.; Nord, Paul J.; and Cox, Robert D., to University of Iowa Research Foundation. Method and composition for determination of n-nitrosamines. 4,256,462, Cl. 23-230.00R.

Franklin, Arthur H., to M. Lowenstein & Sons, Inc. Electromechanical filling indicator for pattern-controlled weaving loom. 4,256,149, Cl. 139-453.000.

Franks, Neal E.; and Varga, Julianna K., to Akzona Incorporated. Composition and process for making precipitated nylon-cellulose biconstituent composition. 4,256,613, Cl. 260-13.000.

Franz, James H.: *See—*
Prines, Frank J.; Matty, Thomas C.; and Franz, James H., 4,257,092, Cl. 363-124.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Syrbe, Max; and Heger, Dirk, 4,257,100, Cl. 364-200.000.

Frech, Kenneth J.; and Wideman, Lawson G., to Goodyear Tire & Rubber Company, The. Continuous morpholine process. 4,256,880, Cl. 544-106.000.

Freer, William G.; and Simon, Jean-Luc, to Ebauches Electroniques S.A. Method for the manufacture of a set of passive electro-optic display cells. 4,255,848, Cl. 29-592.00R.

Fremont, Henry A., to Champion International Corporation. Activated sludge treatment. 4,256,630, Cl. 260-112.00R.

Friberg, Richard L., to General Electric Company. Apparatus for controlling the length of movement of a controlled member along a path of repeated operating positions. 4,257,000, Cl. 318-573.000.

Friedman, Joseph; Hines, William S.; Raniere, Frederick D.; and Silverman, Jacob, to Rockwell International Corporation. Method of producing olefins from hydrocarbons. 4,256,565, Cl. 208-129.000.

Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, to Bayer Aktiengesellschaft. Reactive dyestuffs. 4,256,882, Cl. 544-212.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Orszullok, Willy, 4,256,163, Cl. 137-625.310.

Fries, Ake: *See—*
Berglund, Ake; and Fries, Ake, 4,256,314, Cl. 277-27.000.

Frolov, Averky A.: *See—*
Bobkova, Olga S.; Slotvinsky-Sidak, Nikolai P.; Travin, Oleg V.; and Frolov, Averky A., 4,256,487, Cl. 75-134.00V.

Froschauer, L. E.; Knape, R. U. B.; and Schmidt, D. H., to W. Haldenwanger KG. Method and device for the production of an oxide ceramic tube. 4,256,686, Cl. 264-209.000.

Froschle, Reinhard: *See—*
Richter, Gunter; and Froschle, Reinhard, 4,256,999, Cl. 318-560.000.

Fu, Wallace Y.: *See—*
Ashworth, Robert W.; and Fu, Wallace Y., 4,256,655, Cl. 260-453.0RW.

Fuginaga, Masataka: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, 4,256,914, Cl. 562-535.000.

Fuji Photo Film Co., Ltd.: *See—*
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, 4,256,817, Cl. 430-17.000.
Kondo, Asaji; and Kitajima, Masao, 4,256,693, Cl. 422-56.000.
Konno, Takeshi; Inaba, Masaharu; and Inayama, Takayuki, 4,256,249, Cl. 226-181.000.
Noguchi, Yasuhiro; Sakaguchi, Shinji; and Yoshida, Takashi, 4,256,827, Cl. 430-215.000.

Fujii, Kozo: *See—*
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, 4,256,908, Cl. 560-204.000.

Fujimura, Itaru; Nakamura, Hitoshi; Kuroishi, Shoji; Seko, Nachio; and Ogawa, Toshiyuki, to Ricoh Company, Ltd. Image density adjustment method and apparatus. 4,256,401, Cl. 355-14.00E.

Fujita, Shigeru; Banzai, Hideo; and Goto, Takashi, to Toshiba Kikai Kabushiki Kaisha. Method of and apparatus for controlling resin plasticizing process of in-line screw-type injection molding machines. 4,256,678, Cl. 264-40.100.

Fujiwara, Yasuo: *See—*
Takezono, Tetsuya; and Fujiwara, Yasuo, 4,256,465, Cl. 44-56.000.

Fukuchi, Jun: *See—*
Yoshida, Manabu; Fukuchi, Jun; and Takayanagi, Shigetoshi, 4,256,513, Cl. 136-256.000.

Fukuda, Kumio: *See—*
Shimoma, Taketoshi; Fukuda, Kumio; and Nakamura, Michio, 4,257,024, Cl. 335-213.000.

Fukui, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Oblong piston rings for internal combustion engine. 4,256,067, Cl. 123-193.00P.

Fukui, Takeo: *See—*
Irimajiri, Shoichiro; and Fukui, Takeo, 4,256,068, Cl. 123-193.00P.

Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; Mitsubishi Denki Kabushiki Kaisha; and Mikuni Kogyo Kabushiki Kaisha. Fuel feed device for engine. 4,256,075, Cl. 123-478.000.

Fukuoka, Kenji, to Olympus Optical Co. Ltd. Graphic display system for raster scanning involving wobbling. 4,257,044, Cl. 340-731.000.

Fukuoka, Yohei: *See—*
Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, 4,256,645, Cl. 260-343.500.

Fukushima, Isao; Kimura, Hiroyuki; and Nishijima, Hideo, to Hitachi, Ltd. Limiter circuit for removing nose from demodulated signals. 4,256,975, Cl. 307-543.000.

Funamoto, Akihiko: *See—*
Shimokai, Katzujiro; Kataoka, Masayuki; and Funamoto, Akihiko, 4,256,621, Cl. 260-29.7NR.

Funderburk, Tim; and McLaughlin, Donald W., to GTE Automatic Electric Laboratories Incorporated. Multiport conference circuit with multi-frame summing. 4,257,120, Cl. 370-62.000.

Furberg, Lars: *See—*
Mahler, Oscar; and Furberg, Lars, 4,255,878, Cl. 37-42.0VL.

Furumoto, Horace W.: *See—*
Pike, Charles T.; Furumoto, Horace W.; and Levin, Lawrence A., 4,257,013, Cl. 331-94.50P.

Furusaki, Shinichi: *See—*
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, 4,256,908, Cl. 560-204.000.

Futaba, Kunihiko; Shimazaki, Toshikazu; Osagawa, Atsumi; and Hiraoka, Akira, to Citizen Watch Co., Ltd. Watch case. 4,257,118, Cl. 368-276.000.

Gaal, Sandor: *See—*
Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, 4,256,481, Cl. 71-88.000.

Gabriel, Jean P.; Dumont, Marcel; and Guille, Robert, to Synthelabo. Extraction of sennosides. 4,256,875, Cl. 536-4.000.

Gaerttner, Martin R.; and Hoffman, David W., to Ford Motor Company. Metallization process. 4,256,780, Cl. 427-38.000.

GAF Corporation: *See—*
Loprest, Frank J., 4,256,825, Cl. 430-142.000.

Gagnon, William L.: *See—*
Bradley, Laird P.; Carder, Bruce M.; and Gagnon, William L., 4,257,017, Cl. 332-7.510.

Galactic Concepts & Designs, Inc.: *See—*
Harris, Linda D.; Paretti, Frank J.; and McWhorter, Sharon L., 4,256,281, Cl. 248-231.000.

Gallagher, James A.: *See—*
Brizgys, Bernardas; and Gallagher, James A., 4,256,848, Cl. 521-124.000.

Gallaher Limited: *See—*
Dale, Robert W.; and Rooney, John J., 4,256,609, Cl. 252-455.00Z.

Gambling, Kenneth H.: *See—*
Coward, Noel D.; Collins, Donald G.; and Gambling, Kenneth H., 4,256,133, Cl. 137-78.300.

Gammans, William J.: *See—*
Morris, Don L.; Gammans, William J.; and Holmes, Jerry D., 4,256,916, Cl. 562-537.000.

Gangneux, Philippe Y. E., to Produits Chimiques Ugine Kuhlmann. Phthalone derivatives utilizable as pigments. 4,256,901, Cl. 548-268.000.

Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, to Nitrokemia Ipartelepek. Selective herbicide compositions. 4,256,481, Cl. 71-88.000.

Gardner, James H.; and de Nevers, Noel H., to Oros Company. Server for wine bottles and the like. 4,255,944, Cl. 62-457.000.

Gardner, Victor T. Injection moulding method and apparatus with mould runner reservoir and shot extension. 4,256,689, Cl. 264-328.800.

Garner, Alex V.; and Townsend, Graham, to Tannoy Products Limited. Loudspeaker having improved magnetic assembly. 4,256,930, Cl. 179-116.000.

Garrett Corporation, The: *See—*
Braddick, Peter W., 4,256,019, Cl. 92-94.000.
Morison, Rodney, 4,255,964, Cl. 73-24.000.
Tippetts, Thomas B.; and Manion, Francis M., 4,256,015, Cl. 91-364.000.

Garrett, Michael E.; and Kite, Oliver A. Apparatus and method for treatment of liquids. 4,256,575, Cl. 210-629.000.

Garzon, Ruben D.; McConnell, Lorne D.; and Votta, Gerald A., to Electric power Research Institute, Inc. Moving contact for localized gas flow arc spinner type interrupter. 4,256,939, Cl. 200-147.00R.

Gasper, Ronald S. Clip-on ball holder. 4,256,244, Cl. 224-252.000.

Gast, Theodor: *See—*
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.

Gauthier Industries, Inc.: *See—*
Gauthier, Thomas E., 4,256,119, Cl. 128-754.000.

Gauthier, Thomas E., to Gauthier Industries, Inc. Biopsy needle. 4,256,119, Cl. 128-754.000.

Gavrilin, Vladimir P.: *See—*
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov,

Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.
Gebhardt, Dieter; and Janocha, Siegfried, to Hoechst Aktiengesellschaft. Heat-sealable plastic film. 4,256,784, Cl. 428-216.000.
Gebruder Loepfe AG: *See*—
Loepfe, Erich, 4,256,247, Cl. 226-45.000.
Gehrke, Gunter; Kuhnel, Werner; and Kuth, Robert, to Bayer Aktiengesellschaft. Process for dyeing and printing cellulose fibres. 4,256,460, Cl. 8-532.000.
Gellert, Jobst U.: *See*—
Lord, John; and Gellert, Jobst U., 4,256,584, Cl. 210-446.000.
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., to Mobil Oil Corporation. Phosphorus-containing compounds and lubricants containing same. 4,256,592, Cl. 252-46.700.
General Aviation Electronics, Inc.: *See*—
Henderson, Claude L.; and Shepperd, Michael E., 4,257,121, Cl. 455-89.000.
General Battery Corporation: *See*—
Eberle, William J., 4,256,946, Cl. 219-78.150.
General Dynamics Corporation: *See*—
Turns, Earl W.; Forrester, Robert E., Jr.; and Porter, Arthur C., 4,256,547, Cl. 204-35.00N.
General Electric Company: *See*—
Bailey, Ronald B., 4,256,982, Cl. 307-268.000.
Banino, George M., 4,256,501, Cl. 106-97.000.
Crawford, John G., 4,256,136, Cl. 137-387.000.
Eckberg, Richard P., 4,256,870, Cl. 528-15.000.
Fischer, George A.; and Prohl, Melvin A., 4,256,353, Cl. 308-26.000.
Friberg, Richard L., 4,257,000, Cl. 318-573.000.
Griffith, Robert J.; and Stitt, Thomas D., 4,256,983, Cl. 307-271.000.
Johnson, Robert H.; and Wilkes, Colin, 4,255,927, Cl. 60-39.230.
Johnson, Roger N., 4,255,952, Cl. 68-23.700.
Lindsay, Donald S.; Menk, Charles J.; and Popelish, John A., 4,257,051, Cl. 346-74.500.
Madan, Bhim S., 4,256,265, Cl. 241-92.000.
Payne, Thomas R.; and Baker, Alfred L., 4,256,951, Cl. 219-492.000.
Snider, David M., 4,256,960, Cl. 250-252.000.
General Foods Corporation: *See*—
Shanbhag, Sudhakar P.; and Szczesniak, Alina S., 4,256,772, Cl. 426-331.000.
General Foods, Limited: *See*—
Henderson, Gary A.; Thompson, William J. C.; and Thatcher, John T., 4,256,771, Cl. 426-250.000.
General Instrument Corporation: *See*—
Lipsky, Stephen E., 4,257,047, Cl. 343-120.000.
General Motors Corporation: *See*—
Smith, Jack E.; Roberts, David E.; and Jalbing, John I., 4,256,700, Cl. 422-177.000.
Sullivan, Leo S., Jr.; and DeVincent, Patsy, 4,256,292, Cl. 267-8.00R.
Winnale, James A., 4,256,329, Cl. 280-802.000.
Zeek, Richard M., 4,256,171, Cl. 165-7.000.
Genese, Joseph N.: *See*—
Leahey, John J.; Muetterties, Andrew J.; and Genese, Joseph N., 4,256,105, Cl. 128-214.00G.
Muetterties, Andrew J.; and Genese, Joseph N., 4,256,104, Cl. 128-214.00G.
Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, to Coflexip. Flexible composite tube. 4,256,146, Cl. 138-111.000.
Genz, Earl J., to Illinois Tool Works Inc. Wire engagement and release arrangement. 4,256,358, Cl. 339-95.00D.
Geoffrey, James E., to Ford Motor Company. Passive seat belt system. 4,256,330, Cl. 280-802.000.
Geosource, Inc.: *See*—
Gilbreath, Cecil R., 4,257,053, Cl. 346-108.000.
Gerben, Ralph D.; and Walters, Harry J., to M. S. Willett, Inc. Three axis transfer apparatus. 4,256,218, Cl. 198-621.000.
Gerbig, Hans E.: *See*—
von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, 4,256,165, Cl. 164-147.000.
Gerecht, John F.: *See*—
Epstein, Morton B.; and Gerecht, John F., 4,256,664, Cl. 564-177.000.
Getts, Sidney A. Jig saw with orbitally movable blade. 4,255,858, Cl. 30-393.000.
Giacino, Christopher: *See*—
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,256,776, Cl. 426-535.000.
Gilbreath, Cecil R., to Geosource, Inc. High-resolution laser plotter. 4,257,053, Cl. 346-108.000.
Gilkerson, Francis M. Shoe with supportive girdle liner. 4,255,875, Cl. 36-55.000.
Gillespie, Ronald G., to Texaco Development Corporation. Copper liquor control system. 4,256,695, Cl. 422-62.000.
Gilman, John J., to Allied Chemical Corporation. Armor-piercing projectile. 4,256,039, Cl. 102-52.000.
Gilsenan, John T. Tent roof structure. 4,256,129, Cl. 135-4.00R.
Giraud, Georges; and Mollier, Jean, to Compagnie Internationale pour l'Informatique. System for keeping account of predetermined homogeneous units. 4,256,955, Cl. 235-380.000.
Girling Limited: *See*—
Thomas, Alfred W., 4,256,016, Cl. 91-369.00A.
GKN Sankey Limited: *See*—
Edwards, Michael F.; and Williams, Edward, 4,256,349, Cl. 301-13.0SM.
Glace, William R.: *See*—
Ibsen, Robert L.; and Glace, William R., 4,256,603, Cl. 252-182.000.
Gladky, Ivan N.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.
Gladwin Corporation: *See*—
Lazzaretti, Louis, 4,255,863, Cl. 33-174.00E.
Glaenzer Spicer: *See*—
Alexandre, Orain M., 4,255,945, Cl. 64-21.000.
Glaser, Josef: *See*—
von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, 4,256,165, Cl. 164-147.000.
Glasrock Products, Inc.: *See*—
Morris, Harold B.; and Bright, Donald G., 4,256,845, Cl. 521-61.000.
Glendinning, Scott R. Sun clock. 4,255,864, Cl. 33-270.000.
Glesmann, Herbert C.: *See*—
Rowe, Murray A.; Conway, Robert T.; Glesmann, Herbert C.; and Kruse, Richard W., 4,256,415, Cl. 404-116.000.
Goda, Boyd D.; Simpson, Thomas E.; St. Vincent, Craig J.; and Collura, Peter C., to Kliklok Corporation. Apparatus for forming a hinged carton. 4,256,025, Cl. 493-160.000.
Godfrey, Frederick D., Jr.: *See*—
Higgins, D. Bernard; and Godfrey, Frederick D., Jr., 4,256,124, Cl. 131-29.000.
Godo, Osanori: *See*—
Otsuka, Norimoto; and Godo, Osanori, 4,256,322, Cl. 280-289.00L.
Goebel, Hermann; and Eitel, Kurt, to Bayer Aktiengesellschaft. Iron complex azo dyestuffs. 4,256,634, Cl. 260-149.000.
Goeth, Hanns: *See*—
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.
Goetz, Walter J.: *See*—
DeCarlo, Frank S.; Rosen, Frank L.; and Goetz, Walter J., 4,255,979, Cl. 74-5.470.
Gold, Louis. Cored lens for large refracting telescopes. 4,256,370, Cl. 350-440.000.
Goldfarb, Adolph E.; Benkoe, Erwin, deceased (by Benkoe, Elisabeth, executrix); and Dantzer, Elonne, to Goldfarb, Adolph E.; and Benkoe, Elisabeth, executrix for the estate of Erwin Benkae. Eye assemblies for dolls. 4,255,894, Cl. 46-169.00A.
Goldhaber, Paul, to President and Fellows of Harvard College. Inhibition of bone resorption with H_1-blocking antihistamines. 4,256,743, Cl. 424-247.000.
Goldner, Walter; and Strien, Werner, to Recaro GmbH & Co. Head support for vehicle seats. 4,256,341, Cl. 297-410.000.
Goldschild, Pierre H.; and Franc, Jean, to Schlumberger Technology Corporation. Subsea valve apparatus having hydrate inhibiting injection. 4,256,282, Cl. 251-58.000.
Gommesen, Hans: *See*—
Hansen, Ib; and Gommesen, Hans, 4,256,264, Cl. 241-72.000.
Gonin, Roger B.; Fontanes, Sylvain; and Picquendar, Jean E., to Thomson-CSF. Charge transfer recursive filter. 4,257,019, Cl. 333-165.000.
Goode, Burwell, to Satellite Business Systems. Capacity reallocation method and apparatus for a TDMA satellite communication network with demand assignment of channels. 4,256,925, Cl. 370-104.000.
Goodson, Louis H.; and Jacobs, William B., to Midwest Research Institute. Specificity of semiconductor gas sensor. 4,256,985, Cl. 307-308.000.
Goodyear Tire & Rubber Company, The: *See*—
Frech, Kenneth J.; and Wideman, Lawson G., 4,256,880, Cl. 544-106.000.
Goorden, Josephus J. P. M., to Stamicarbon, B.V. Process for the separation of ammonia and carbon dioxide from mixtures containing ammonia, carbon dioxide and water. 4,256,471, Cl. 55-70.000.
Gorbachev, Anatoly K.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.
Gore, William C., to Portec, Inc. Insulated rail joint. 4,256,259, Cl. 238-160.000.
Gorike, Rudolf. Stereophonic effect speaker arrangement. 4,256,922, Cl. 179-1.0GA.
Goring, Joachim E.; and Ochlich, Peter P., to Wulfing, Johann A. Pharmaceutical compositions. 4,256,750, Cl. 424-253.000.

Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M. Process for producing urea. 4,256,662, Cl. 564-67.000.

Gorog nee Privitzer, Katalin: *See*—
Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, 4,256,481, Cl. 71-88.000.

Gorsuch, Ian. A flexible abrasive coated article and method of making it. 4,256,467, Cl. 51-295.000.

Gose, William C.: *See*—
Vanderbilt, Jeffrey J.; Gose, William C.; and Cleveland, James P., 4,256,888, Cl. 544-334.000.

Goss, David C.; and Hageman, Richard A., to Thermon Manufacturing Company. Conduction heating assembly. 4,256,452, Cl. 432-225.000.

Goss, Lloyd C., to Magnetic Peripherals Inc. Time optimal function generator for disk file magnetic recording head servo position control loop. 4,257,074, Cl. 360-78.000.

Goto, Takashi: *See*—
Fujita, Shigeru; Banzai, Hideo; and Goto, Takashi, 4,256,678, Cl. 264-40.100.

Gotz, Bernhard: *See*—
Abels, Theodor; and Gotz, Bernhard, 4,255,984, Cl. 74-474.000.

Gould Inc.: *See*—
Doubrava, James H.; and Thellmann, Edward L., 4,256,810, Cl. 428-550.000.

Goyette, Richard G. Solo-operable bench press device. 4,256,301, Cl. 272-123.000.

Gozzo, Franco: *See*—
Boschi, Pier M.; Gozzo, Franco; and Longoni, Angelo, 4,256,902, Cl. 548-365.000.

Graham, David J. Electromechanical therapeutic apparatus. 4,256,095, Cl. 128-24.100.

Grahl, Darwin R.; and Krause, Walter O., to Parker-Hannifin Corporation. Discharge line filter-dryer. 4,255,940, Cl. 62-324.300.

Gramelt, Stefan: *See*—
Noack, Rolf; and Gramelt, Stefan, 4,256,606, Cl. 252-411.00R.

Graninger, Frank J., to Allen-Bradley Company. Pneumatic timer with eccentrically disposed valve needle. 4,256,021, Cl. 92-143.000.

Gras, Rainer, to Chemische Werke Huls AG. Process for the coating of glass surfaces. 4,256,788, Cl. 428-35.000.

Grayson, Robert E. Nut, bolt, and screw holder. 4,256,157, Cl. 145-46.000.

Green, Lawrence E., to Polaroid Corporation. Slide mounting apparatus. 4,256,527, Cl. 156-443.000.

Green, Mino, to Imperial Chemical Industries Limited. Electrochromic device. 4,256,379, Cl. 350-357.000.

Green, Peter T.; and Beck, Nicholas J., to Walker Crosweller & Company Limited. Spray nozzle for shower apparatus. 4,256,263, Cl. 239-487.000.

Greenbaum, George. Modular plant device. 4,255,898, Cl. 47-85.000.

Greider, Charles A., to AMF Incorporated. Snow blower dead man control. 4,255,879, Cl. 37-43.00R.

Greutert, Albert, to Maxs AG. Coffee filter with drip tray. 4,256,585, Cl. 210-474.000.

Greve, Manfred, to Sandoz Ltd. Optionally further substituted 5-(2'- or 4'-phenoxyphenylazo)-6-hydroxypyridone-2 compounds containing a cationic group in the 1-position. 4,256,635, Cl. 260-156.000.

Greven, Hendrik M.: *See*—
de Wied, David; and Greven, Hendrik M., 4,256,736, Cl. 424-177.000.

Greyhound Corp., The: *See*—
Lewis, Ronald G.; and Pavelek, Joseph M., 4,256,600, Cl. 252-132.000.

Grice, Steven L.: *See*—
McMickle, Robert L.; Ader, Gary B.; and Grice, Steven L., 4,255,880, Cl. 37-43.00B.

Griengl, Herfried; and Foidl, Gabriele, to PLC Pharmaceutical Licenses Co. Ltd. Process for making derivatives of dimers of isoeugenol. 4,256,764, Cl. 424-285.000.

Griffith, Robert J.; and Stitt, Thomas D., to General Electric Company. Voltage-to-frequency converter having a constant frequency mode of operation. 4,256,983, Cl. 307-271.000.

Griffith, Rodney. Wave and wind motion energy transducer. 4,256,971, Cl. 290-53.000.

Grinchuk, Petr S.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Gross, Raymond J.; and Buscho, Lane M., to Mattel, Inc. Spinning top hockey-type game. 4,256,306, Cl. 273-85.00R.

Gross, Richard L.: *See*—
Sauerwein, Lewis E.; and Gross, Richard L., 4,256,036, Cl. 101-45.000.

Groya, George J.: *See*—
Hochstatter, Brian R.; and Groya, George J., 4,256,155, Cl. 142-7.000.

Grumag Geraete- und Maschinen GmbH: *See*—
Kroger, Dietrich, 4,256,014, Cl. 91-216.00B.

Grumman Aerospace Corporation: *See*—
Ciminera, Victor R.; and Hendrickson, Ronald H., 4,256,276, Cl. 244-118.100.

Grychtol, Klaus: *See*—
Degen, Hans-Juergen; Feichtmayr, Franz; and Grychtol, Klaus, 4,256,458, Cl. 8-506.000.

Grymonprez, Paul A.; Ruyssers, Robert H. M.; and Barker, Brian G., to Exxon Research & Engineering Co. Method and apparatus for testing the setting of a valve. 4,255,967, Cl. 73-168.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Funderburk, Tim; and McLaughlin, Donald W., 4,257,120, Cl. 370-62.000.

GTE Products Corporation: *See*—
Fisher, Gary J.; Morean, James E.; Simmons, Perley F.; and VanGorden, Steven N., 4,256,390, Cl. 354-1.000.
Kuo, Samuel C., 4,257,049, Cl. 343-792.500.
Quatrini, Lucretia R., 4,256,708, Cl. 423-61.000.

Gudmundsen, Richard A.: *See*—
Soohoo, Jack E.; McNutt, Michael J.; Yao, Shi-Kay; Hayes, Cecil L.; and Gudmundsen, Richard A., 4,257,111, Cl. 365-114.000.

Guenther, Roland: *See*—
Schwarting, Karl-Heinz; and Guenther, Roland, 4,256,345, Cl. 299-43.000.

Guequierre, Denis D.: *See*—
Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,256,474, Cl. 55-482.000.

Guibert, Marcel H.: *See*—
Lemesle, Marcel E.; Guibert, Marcel H.; and Le Moing, Claude A., 4,256,365, Cl. 350-96.180.

Guigues, Francois; Mourier, Jacqueline; and Demozay, Daniel, to Philagro. Isoxazolyl-alkyl thiocarbamates and herbicidal compositions thereof. 4,256,480, Cl. 71-88.000.

Guille, Robert: *See*—
Gabriel, Jean P.; Dumont, Marcel; and Guille, Robert, 4,256,875, Cl. 536-4.000.

Guilmin, Francois: *See*—
Lovichi, Jean-Pierre; LeBras, Bernard; Guyot, Robert; and Guilmin, Francois, 4,256,502, Cl. 106-100.000.

Gulf Oil Corporation: *See*—
Hoffmann, Otto L.; and Patel, Natu R., 4,256,884, Cl. 544-240.000.

Gulf & Western Corporation: *See*—
Higgins, D. Bernard; and Godfrey, Frederick D., Jr., 4,256,124, Cl. 131-29.000.

Gulliksen, John E., to Koehler Manufacturing Company. Method and apparatus for controlling radiant energy. 4,257,086, Cl. 362-279.000.

Gunn, Kenneth M., to Texaco Inc. System for dispensing a volatile fuel. 4,256,151, Cl. 141-59.000.

Gunter, Richard C. Safety device for clamp for medical solution administration systems. 4,256,132, Cl. 137-14.000.

Gunti, Rolf, to Masyc A.G. Transfer conveyor for the transfer of piece goods from a first roller track conveyor to a second roller track conveyor. 4,256,222, Cl. 198-457.000.

Gurney, Richard S., to H. B. Fuller Company. Highway striping method and apparatus. 4,256,261, Cl. 239-155.000.

Gurol, I. Macit: *See*—
Chapel, Roy W., Jr.; and Gurol, I. Macit, 4,257,061, Cl. 357-69.000.

Guschky & Tonnesmann GmbH & Co. KG: *See*—
Strohband, Rolf, 4,256,027, Cl. 493-11.000.

Gutehoffnungshutte Sterkrade AG: *See*—
Schwarting, Karl-Heinz; and Guenther, Roland, 4,256,345, Cl. 299-43.000.

Gutermuth, Paul F.; and Detjen, Heinrich W. Device for the conversion of solar radiation into heat. 4,256,092, Cl. 126-449.000.

Guyot, Robert: *See*—
Lovichi, Jean-Pierre; LeBras, Bernard; Guyot, Robert; and Guilmin, Francois, 4,256,502, Cl. 106-100.000.

Gyenis, Janos: *See*—
Blickle, Tibor; Komaromy, Zsigmond; Filka, Judit; Gyenis, Janos; and Borlai, Oszkar, 4,256,576, Cl. 62-538.000.

H. B. Fuller Company: *See*—
Gurney, Richard S., 4,256,261, Cl. 239-155.000.

Haan, John R. Endplate stop for silage distributor. 4,256,419, Cl. 406-161.000.

Haas, Johannes: *See*—
Quester, Karl W.; Haas, Johannes; Ulbrich, Hans-Joachim; and Schroder, Dieter, 4,255,869, Cl. 34-25.000.

Haase, Samuel. Collapsible container for milk cartons. 4,256,236, Cl. 220-6.000.

Hafner, Heinz: *See*—
Dietrich, Rolf; Hafner, Heinz; and Pecher, Wolfgang, 4,256,393, Cl. 354-145.000.

Hageman, Richard A.: *See*—
Goss, David C.; and Hageman, Richard A., 4,256,452, Cl. 432-225.000.

Hager, Robert G. Pull handle for roller mounted suitcases. 4,256,320, Cl. 280-37.000.

Haggstrom, Walter R. G.: *See*—
Thompson, David E.; and Haggstrom, Walter R. G., 4,256,510, Cl. 134-6.000.

Haire, Michael J., to Du Pont de Nemours, E. I., and Company. Antidepressant oxime ethers of dibenzocycloheptaziridones. 4,256,742, Cl. 424-244.000.

Halbleib, Chester W.: *See*—
Barton, Danny B.; Halbleib, Chester W.; and Lonsinger, Jack J., 4,256,661, Cl. 564-18.000.

Hall, David S. Fixed interval variable period pulse rate measuring method and system and tachometer system using same. 4,257,005, Cl. 324-166.000.

Halliburton Company: *See*—
Howe, Thomas W., 4,255,847, Cl. 29-445.000.

Halvorsen, Kare E. Hook for lifting rollers, in particular, a reeling drum hook. 4,256,336, Cl. 294-82.00R.

Ham Industries, Inc.: *See*—
Loughry, H. Hampton; and Zeewy, Abraham, 4,257,063, Cl. 358-108.000.

Hamar, Douglas A. Bicycle brake adjustment device. 4,256,205, Cl. 188-24.000.

Hamilton, Carl L., to HEC, Incorporated. Retractable truck bed mounted trailer hitch. 4,256,324, Cl. 280-433.000.

Hancock, Leonard H. Hydraulic control. 4,256,142, Cl. 137-596.000.

Handelsbolaget Evaksystem Ekstrom & Co.: *See*—
Ekstrom, Stig O. M., 4,256,523, Cl. 156-190.000.

Hang, Kenneth W.; and Anderson, Wayne M., to RCA Corporation. Partially devitrified porcelain composition and articles prepared with same. 4,256,796, Cl. 428-210.000.

Hanley, Martin G. Dual end rotary tiller blade. 4,256,183, Cl. 172-42.000.

Hanna, Earl M.: *See*—
Sokol, Larry S.; McComas, Charles C.; and Hanna, Earl M., 4,256,779, Cl. 427-34.000.

Hannah, Richard E., to Baxter Travenol Laboratories, Inc. High flow lined valve for medical applications. 4,256,135, Cl. 137-375.000.

Hannon, Martin J.; and Forschirm, Alex S., to Celanese Corporation. Powder composition and method of preparation. 4,256,232, Cl. 215-12.00R.

Hansen, Ib; and Gommesen, Hans, to F. L. Smidth & Co. Tube mill. 4,256,264, Cl. 241-72.000.

Hansen, LeRoy C.: *See*—
Collett, Kenneth R.; and Hansen, LeRoy C., 4,256,086, Cl. 126-271.20C.

Hansen, Quinten A. Torque overload sensing device. 4,255,946, Cl. 64-29.000.

Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Method of stabilizing organic substrate materials including photographic dye images to light and a photographic material so stabilized. 4,256,817, Cl. 430-17.000.

Haraguchi, Keisuke; and Nakamura, Susao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera automatic film winding device. 4,256,394, Cl. 354-173.000.

Harashima, Kiyoshi: *See*—
Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,256,355, Cl. 312-198.000.

Harding, Sune, to AB Wicanders Korkfabriker. Blank for a bottle cap. 4,256,233, Cl. 215-254.000.

Hare, Jerry B., to Monsanto Company. Process for solvent bonding blended nonwoven fabrics and fabric produced therefrom. 4,256,524, Cl. 156-220.000.

Hareland, Ingvar, to ASEA Aktiebolag. Laminated metallic plates for supporting core leg in inductive electrical devices to determine magnetic circuit. 4,257,025, Cl. 336-84.00M.

Harlos, Hartmut: *See*—
Juhnke, Klaus; and Harlos, Hartmut, 4,256,981, Cl. 307-266.000.

Harnisch, Horst: *See*—
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,256,882, Cl. 544-212.000.

Harpster, Joseph W. C., to Intek, Inc. Flow indicator. 4,255,968, Cl. 73-204.000.

Harriau, Robert R.: *See*—
Huppunen, Robert D.; and Harriau, Robert R., 4,256,252, Cl. 228-1.00A.

Harris Corporation: *See*—
Bardos, Andrew M., 4,256,362, Cl. 350-3.860.

Harris, Linda D.; Paretti, Frank J.; and McWhorter, Sharon L., to Galactic Concepts & Designs, Inc. Cup holding apparatus. 4,256,281, Cl. 248-231.000.

Harrison, Cecil P., to Tennessee Valley Authority. Granulation of fertilizer borate. 4,256,479, Cl. 71-61.000.

Harrison, Roger G., Jr.; and Prichard, Thomas H., to Upjohn Company, The. Process for precipitating aminoglycosides. 4,256,876, Cl. 536-12.000.

Hartman, Albert, Jr.: *See*—
Jones, W. Richard; Hartman, Albert, Jr.; Conrad, Earl; and Kraig, Harry J., 4,255,928, Cl. 60-324.000.

Hartmann, Werner: *See*—
Kusters, Eduard; and Hartmann, Werner, 4,256,034, Cl. 100-38.000.

Hase, Jun-ichi: *See*—
Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, 4,256,765, Cl. 424-315.000.

Hashimoto, Shunichi: *See*—
Asao, Shuichiro; Nakayama, Yoshinori; Yoshida, Ryo; Sumida, Seizo; and Hashimoto, Shunichi, 4,256,483, Cl. 71-92.000.

Haslam, David G.: *See*—
Hildreth, John D.; Haslam, David G.; and Allen, David E., 4,256,671, Cl. 564-422.000.

Hatanaka, Masayuki; and Nagashima, Shigeru. Platinum complexes for silicone compositions. 4,256,616, Cl. 260-18.00S.

Hatcher, Cecil W., to Concrete Safety Equipment, Inc. Concrete surfacing machine. 4,256,344, Cl. 299-39.000.

Hattori, Shuzo; Kamide, Noboru; Tokudome, Katumi; Ishikawa, Michio; and Hayashi, Yuzi, to Kimmon Electric Co., Ltd. Gas laser discharge tube using corrugated cathode. 4,257,014, Cl. 331-94.5PE.

Hatuse, Toshikazu; Natori, Minoru; Shimazaki, Toshikazu; Kawanobe, Kouhei; and Ogawa, Hiroshi, to Citizen Watch Co., Ltd. Switch structure for electronic timepiece. 4,257,115, Cl. 368-69.000.

Hauni-Werke Korber & Co. KG: *See*—
Rudszinat, Willy, 4,255,998, Cl. 83-298.000.

Hauptmann, Gunter: *See*—
Ick, Jurgen; Meiners, Hans J.; Oertel, Gunter; Hauptmann, Gunter; and Konig, Klaus, 4,256,849, Cl. 521-129.000.

Havens, Marvin R.; Fields, Donald R.; and Miller, Douglas J., to Union Carbide Corporation. High-temperature, high-pressure valve packing system. 4,256,317, Cl. 277-112.000.

Hayashi, Kimiaki; Kato, Jyoji; Uchida, Tomofumi; and Yoneda, Naoto, to Tanabe Seiyaku Co., Ltd. Tetrahydroisoquinoline derivatives. 4,256,751, Cl. 424-258.000.

Hayashi, Masaki; Tanouchi, Tadao; Kawamura, Masanori; and Kajiwara, Ikuo, to Ono Pharmaceutical Co., Ltd.; and Kissei Pharmaceutical Co., Ltd. 1-Substituted imidazoles for inhibition of thromboxane synthetase. 4,256,757, Cl. 424-273.00R.

Hayashi, Yuzi: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katumi; Ishikawa, Michio; and Hayashi, Yuzi, 4,257,014, Cl. 331-94.5PE.

Hayes, Cecil L.: *See*—
Soohoo, Jack E.; McNutt, Michael J.; Yao, Shi-Kay; Hayes, Cecil L.; and Gudmundsen, Richard A., 4,257,111, Cl. 365-114.000.

Hazue, Masaaki: *See*—
Kato, Makoto; and Hazue, Masaaki, 4,256,726, Cl. 424-1.000.

HEC, Incorporated: *See*—
Hamilton, Carl L., 4,256,324, Cl. 280-433.000.

Hedstrom Co.: *See*—
Boucher, Raymond W., 4,256,300, Cl. 272-85.000.

Heger, Dirk: *See*—
Syrbe, Max; and Heger, Dirk, 4,257,100, Cl. 364-200.000.

Heian Iron Works, Ltd.: *See*—
Suzuki, Yukitomo; and Honda, Masakazu, 4,257,103, Cl. 364-474.000.

Heim, John N. Heat insulative material articles comprising aramid fibers. 4,255,817, Cl. 2-2.000.

Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., to United States of America, Interior. Leaching agglomerated gold - silver ores. 4,256,705, Cl. 423-27.000.

Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., to United States of America, Interior. Leaching agglomerated gold - silver ores. 4,256,706, Cl. 423-29.000.

Heinz, Lothar R., to Siemens Medical Laboratories, Inc. Radiotherapy apparatus with two light beam localizers. 4,256,966, Cl. 250-491.000.

Heise, Arend: *See*—
Horstmann, Harald; Bossert, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,256,749, Cl. 424-251.000.

Helms, Curtis R.; and Smyly, Harold M., to United States of America, National Aeronautics and Space Administration. Prosthetic urinary sphincter. 4,256,093, Cl. 128-1.00R.

Helms, William E.; and Adams, Jack W., to Thomas & Betts Corporation. Automatic harness tester. 4,257,002, Cl. 324-66.000.

Henderson, Claude L.; and Shepperd, Michael E., to General Aviation Electronics, Inc. Portable transceiver. 4,257,121, Cl. 455-89.000.

Henderson, Gary A.; Thompson, William J. C.; and Thatcher, John T., to General Foods, Limited. Continuous gelatinization process. 4,256,771, Cl. 426-250.000.

Henderson, Harry J. Process for repairing small leaks in metallic vessels. 4,255,845, Cl. 29-402.020.

Hendrickson, Ronald H.: *See*—
Ciminera, Victor R.; and Hendrickson, Ronald H., 4,256,276, Cl. 244-118.100.

Hendrickson, Thomas E., to Honeywell Inc. Alternating polarity power supply control apparatus. 4,256,977, Cl. 307-571.000.

Hendrickson, Thomas E.; and Spindler, Thomas C., to Honeywell, Inc. Alternating polarity power supply control apparatus. 4,256,979, Cl. 307-571.000.

Hengartner, Urs O.: *See*—
Batcho, Andrew D.; Hengartner, Urs O.; Leimgruber, Willy; Scott, John W.; and Valentine, Donald, Jr., 4,256,641, Cl. 260-326.14T.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Cioc, Alexander; Kunzel, Werner; and Meyer, Klaus, 4,256,231, Cl. 215-1.00C.

Henson, Paul D.: *See*—
Benner, Roland G.; and Henson, Paul D., 4,256,669, Cl. 564-434.000.

Hentschel, Peter: *See*—
Schulze, Helmut; Zengel, Hans; Brodowski, Walter; Huntjens, Franciscus J.; Schutijser, Jan A. J.; and Hentschel, Peter, 4,256,869, Cl. 528-67.000.

Herbert, Linton M. Underwater vision device. 4,256,386, Cl. 351-43.000.

Herman, Stewart T.: *See*—
Mazer, Marshall R.; Jassund, Steven A.; and Herman, Stewart T., 4,256,468, Cl. 55-8.000.

Herndon, William H., to Fairchild Camera and Instrument Corp. Inverse transistor coupled memory cell. 4,257,059, Cl. 357-46.000.

Herring, William T. Gang slat for flooring of an animal shelter and having a waste-passage grate. 4,256,057, Cl. 119-28.000.

Hess, Karl; Streetman, Ben G.; and Morkoc, Hadis, to University of Illinois Foundation. Negative resistance heterojunction devices. 4,257,055, Cl. 357-16.000.

Hesston Corporation: *See*—
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., 4,255,985, Cl. 74-479.000.

Hewlett-Packard Company: *See*—
Martin, Larry R.; and Marzalek, Michael S., 4,257,104, Cl. 364-485.000.

Heymsfield, Steven B.; and Sinclair, Michael J. Measuring device. 4,257,107, Cl. 364-560.000.

Heyn, Klaus; and Pogrzeba, Hans J., to STEAG Aktiengesellschaft. Installation for recovering energy from solid fossil fuels, more particularly bituminous coal high in inerts. 4,255,926, Cl. 60-39.120.

Hi-Stat Manufacturing Company, Inc.: *See—*
Kochanski, Aloysius J.; Mowery, Frank D.; and Hire, Charles J., 4,256,973, Cl. 307-118.000.

Hickman, Janet C.: *See—*
Zweigle, Maurice L.; and Hickman, Janet C., 4,256,505, Cl. 106-171.000.

Hickman, Ronald P.; and Styman, Alan F., to Inventec Licensing B.V. Portable workbench. 4,256,294, Cl. 269-16.000.

Higashi, Mitsuo: *See—*
Yoshida, Katsuyoshi; Higashi, Mitsuo; Kanamaru, Tatsuya; and Nakayama, Motohiro, 4,256,519, Cl. 148-156.000.

Higgins, D. Bernard; and Godfrey, Frederick D., Jr., to Gulf & Western Corporation. Method and apparatus for manufacturing filter cigar. 4,256,124, Cl. 131-29.000.

Hildreth, John D.; Haslam, David G.; and Allen, David E., to Clayton Aniline Company, Ltd. Production of 2,4- and 2,6-diaminotoluenes. 4,256,671, Cl. 564-422.000.

Hill, Amos G.: *See—*
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., 4,255,985, Cl. 74-479.000.

Hill, John A.: *See—*
Lackman, Leslie M.; and Hill, John A., 4,256,790, Cl. 428-73.000.

Hilti Aktiengesellschaft: *See—*
Theissig, Werner; and Teger, Gerhard, 4,256,422, Cl. 408-241.00S.

Hines, William S.: *See—*
Friedman, Joseph; Hines, William S.; Raniere, Frederick D.; and Silverman, Jacob, 4,256,565, Cl. 208-129.000.

Hino, Katsuhiko: *See—*
Uno, Hitoshi; Nagai, Yasutaka; Hino, Katsuhiko; and Nakamura, Hideo, 4,256,753, Cl. 424-263.000.

Hinojosa, Octavio G.: *See—*
Hinojosa, Servando G.; and Hinojosa, Octavio G., 4,256,446, Cl. 425-115.000.

Hinojosa, Servando: *See—*
Hinojosa, Servando G.; and Hinojosa, Octavio G., 4,256,446, Cl. 425-115.000.

Hinojosa, Servando G.; and Hinojosa, Octavio G., to Hinojosa, Servando. Apparatus for manufacturing prefinished wallboard. 4,256,446, Cl. 425-115.000.

Hirae, Toshiyuki: *See—*
Yamamoto, Satoshi; Hirae, Toshiyuki; and Koizumi, Yasunori, 4,256,591, Cl. 252-12.000.

Hirai, Minoru: *See—*
Yoshida, Masatoshi; and Hirai, Minoru, 4,256,607, Cl. 252-117.000.

Hiraoka, Akira: *See—*
Futaba, Kunihiko; Shimazaki, Toshikazu; Osagawa, Atsumi; and Hiraoka, Akira, 4,257,118, Cl. 368-276.000.

Hire, Charles J.: *See—*
Kochanski, Aloysius J.; Mowery, Frank D.; and Hire, Charles J., 4,256,973, Cl. 307-118.000.

Hirota, Kashichi, to Kyowa Electric & Chemical Co., Ltd. Nestable and stackable six-bottle carrier. 4,256,224, Cl. 206-203.000.

Hirt, Dieter, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Arrangement for the controllable operation of valves. 4,256,065, Cl. 123-90.110.

Hishikawa, Shintaro: *See—*
Matsumoto, Kenji; Hishikawa, Shintaro; and Ito, Yoshikatsu, 4,256,492, Cl. 106-22.000.

Hitachi, Ltd.: *See—*
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.
Asada, Akihiro; Tanaka, Hiromichi; and Ohta, Kaname, 4,256,980, Cl. 307-254.000.
Fukushima, Isao; Kimura, Hiroyuki; and Nishijima, Hideo, 4,256,975, Cl. 307-543.000.
Kawamata, Shigeru; and Tsukuda, Kiyoshi, 4,257,060, Cl. 357-49.000.
Kawamura, Hiromitsu; Misumi, Akira; and Odawara, Kozo, 4,256,495, Cl. 106-53.000.
Nakamura, Michiharu; Yamashita, Shigeo; Kuroda, Takao; and Umeda, Jun-ichi, 4,257,011, Cl. 331-94.50H.
Takahashi, Sadao; and Katoh, Yoshiaki, 4,256,963, Cl. 250-296.000.

Hitachi Medical Corporation: *See—*
Horiba, Isao; Kuwabara, Yasuo; Takagi, Hiroshi; and Satou, Shigeru, 4,257,102, Cl. 364-414.000.

Hitchcock, Kenneth H. Pet feeder. 4,256,054, Cl. 119-51.110.

Hitco: *See—*
Tarasen, William L., 4,256,868, Cl. 528-9.000.

Hiyama, Howard K.: *See—*
Hiyama, Kazuo; and Hiyama, Howard K., 4,255,922, Cl. 56-330.000.

Hiyama, Kazuo; and Hiyama, Howard K. Apparatus for use in drying and harvesting vine borne crops and performing other work operations. 4,255,922, Cl. 56-330.000.

Hizume, Akio: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.

Hoback, Roy W.: *See—*
Blankenship, John E.; and Hoback, Roy W., 4,255,916, Cl. 53-404.000.

Hochstatter, Brian R.; and Groya, George J., to Emerson Electric Co. Wood lathe with duplicating means. 4,256,155, Cl. 142-7.000.

Hockett, Wayne B. Abrasive cleaning apparatus. 4,255,906, Cl. 51-429.000.

Hodes, Gary: *See—*
Avigal, Yitzhak; Cahen, David; Hodes, Gary; and Manassen, Joost, 4,256,814, Cl. 429-111.000.

Hoechst Aktiengesellschaft: *See—*
Fischer, Edgar; Brandrup, Johannes; and Weinlich, Jurgen, 4,256,854, Cl. 525-242.000.
Gebhardt, Dieter; and Janocha, Siegfried, 4,256,784, Cl. 428-216.000.

Hoefer, Wayne A., to Caterpillar Tractor Co. Fluid control circuit for brakes and the like. 4,256,350, Cl. 303-6.00M.

Hoefke, Wolfgang: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,256,756, Cl. 424-273.00R.

Hoehn, Harvey H.; and Toy, Stephen T., to Du Pont de Nemours, E. I., and Company. Separation and recovery of B and T lymphocytes. 4,256,588, Cl. 210-692.000.

Hoffman, David W.: *See—*
Gaerttner, Martin R.; and Hoffman, David W., 4,256,780, Cl. 427-38.000.

Hoffmann-La Roche Inc.: *See—*
Batcho, Andrew D.; Hengartner, Urs O.; Leimgruber, Willy; Scott, John W.; and Valentine, Donald, Jr., 4,256,641, Cl. 260-326.14T.
Chodnekar, Madhukar S.; and Kaiser, Ado, 4,256,748, Cl. 424-251.000.
Field, George F.; and Zally, William J., 4,256,637, Cl. 260-239.0BD.
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,256,911, Cl. 560-227.000.
Klaus, Michael J.; and Pawson, Beverly A., 4,256,878, Cl. 542-412.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,256,886, Cl. 544-323.000.

Hoffmann, Otto L.; and Patel, Natu R., to Gulf Oil Corporation. 1-Benzoyl-3-hydroxy-6(1H)-pyridazinones and use as plant growth regulators. 4,256,884, Cl. 544-240.000.

Hogami, Toshihiko: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, 4,256,914, Cl. 562-535.000.

Hogenson, Raymond A., to Minnesota Mining and Manufacturing Company. Multiple sheet sensor and deflector. 4,256,299, Cl. 271-262.000.

Holland, Cropper W., Jr.: *See—*
Cowart, William L.; Holland, Cropper W., Jr.; and Scarbrough, Don R., Sr., 4,256,012, Cl. 89-1.816.

Holland, George W.; Jernow, Jane L.; and Rosen, Perry, to Hoffmann-La Roche Inc. 16-Substituted prostaglandin intermediate. 4,256,911, Cl. 560-227.000.

Holmes, Jerry D.: *See—*
Morris, Don L.; Gammans, William J.; and Holmes, Jerry D., 4,256,916, Cl. 562-537.000.

Holmes, Timothy R.: *See—*
Flick, Edward A.; Holmes, Timothy R.; and Larson, Myles A., 4,256,275, Cl. 244-3.190.

Holmstrom, Sven N. H.; and Rosenberg, Knut A., to Tetra Pak International AB. Weblike laminated packing material and a method for the manufacture of such a material. 4,256,791, Cl. 428-77.000.

Holtey, Thomas O.; and Yu, Kin C., to Honeywell Information Systems Inc. Hardware in a computer system for maintenance by a remote computer system. 4,257,101, Cl. 364-200.000.

Holtz, Herman, to Magnetoplan H. Jo. Holtz. Magnetic clip device. 4,255,837, Cl. 24-243.00R.

Holzwarth, Siegfried, to Brown, Boveri & Cie AG. Method and device for optimally stabilizing the windings of transformers and chokes. 4,255,868, Cl. 34-12.000.

Homeier, Edwin H., to UOP Inc. Production of amino substituted aromatic compounds. 4,256,670, Cl. 564-416.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Fukui, Takeo, 4,256,067, Cl. 123-193.00P.
Irimajiri, Shoichiro; and Fukui, Takeo, 4,256,068, Cl. 123-193.00P.
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, 4,256,346, Cl. 301-64.0SH.
Otsuka, Norimoto; and Godo, Osanori, 4,256,322, Cl. 280-289.00L.

Honda, Masakazu: *See—*
Suzuki, Yukitomo; and Honda, Masakazu, 4,257,103, Cl. 364-474.000.

Honeywell Inc.: *See—*
Davidson, James V., 4,256,285, Cl. 251-283.000.
Hendrickson, Thomas E., 4,256,977, Cl. 307-571.000.
Hendrickson, Thomas E.; and Spindler, Thomas C., 4,256,979, Cl. 307-571.000.
Koepke, Barry G.; and McHenry, Kelly D., 4,256,792, Cl. 428-119.000.
Pinckaers, B. Hubert, 4,256,978, Cl. 307-584.000.

Honeywell Information Systems Inc.: *See—*
Holtey, Thomas O.; and Yu, Kin C., 4,257,101, Cl. 364-200.000.
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,255,852, Cl. 29-837.000.

Honig, Gunter: *See—*
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.

Hooker Chemicals & Plastics Corp.: *See*—
Dachs, Norman W., 4,256,625, Cl. 260-40.00R.
Mose, Luciano; Schurig, Helmut; and Strasser, Bernd, 4,256,562, Cl. 204-258.000.
Hopkins, Harry C. Preparation of epoxy resin-rubber-glass mixture and mixture produced. 4,256,612, Cl. 260-2.300.
Hopkins, Robert M.; and Parsons, Roger C., to Resource Development Consultants Ltd. Method and apparatus for drilling a hole in a body of ice and for the destruction of a body of ice. 4,256,188, Cl. 175-18.000.
Hopkinson, Dennis, to Access Control Systems Pty. Ltd. Code identification apparatus. 4,256,956, Cl. 235-449.000.
Horacek, Heinrich; Schoen, Ernst; Reich, Erhardt; and Volkert, Otto, to BASF Aktiengesellschaft. Manufacture of light-stable polyurethane integral foams. 4,256,841, Cl. 521-51.000.
Horiba, Isao; Kuwabara, Yasuo; Takagi, Hiroshi; and Satou, Shigeru, to Hitachi Medical Corporation. Apparatus for axial transverse tomography. 4,257,102, Cl. 364-414.000.
Horiba, Ltd.: *See*—
Ishida, Kozo; Saitoh, Osamu; and Imaki, Takao, 4,256,964, Cl. 250-345.000.
Horimoto, Mitsuaki, to Minolta Camera Kabushiki Kaisha. Fish eye lens system. 4,256,373, Cl. 350-463.000.
Horodysky, Andrew G.: *See*—
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., 4,256,592, Cl. 252-46.700.
Horstmann, Harald; Bossert, Friedrich; Heise, Arend; and Kazda, Stanislav, to Bayer Aktiengesellschaft. Fluorine-containing 1,4-dihydropyridine compounds, pharmaceutical compositions thereof and their medicinal use. 4,256,749, Cl. 424-251.000.
Horton, James A.; and Weis, John A., to Jersey Nuclear-Avco Isotopes, Inc. Laser pulse superimposing. 4,256,962, Cl. 250-281.000.
Hoskinson, William R.: *See*—
Schwartz, Harold O.; and Hoskinson, William R., 4,256,002, Cl. 84-1.010.
Howard, Michael S. Hydrometallurgical process for the recovery of silver as silver halide or silver pseudohalide from waste photographic paper and film and other sensitized materials. 4,256,704, Cl. 423-27.000.
Howarth, Thomas T.: *See*—
Ponsford, Roger J.; and Howarth, Thomas T., 4,256,638, Cl. 260-245.300.
Howden, Dwight E.: *See*—
Feighery, James M.; and Howden, Dwight E., 4,256,269, Cl. 242-66.000.
Howe, Thomas W., to Halliburton Company. Method of making a knockdown centralizer. 4,255,847, Cl. 29-445.000.
Hsu, Chin C., to B. F. Goodrich Company, The. Liquid reactive polymers. 4,256,910, Cl. 560-209.000.
Hubner, Kurt, to Ebauches Electroniques S.A. Electronic time-piece with barometric indicator. 4,257,112, Cl. 368-11.000.
Hudgins, Jimmy R. Post pulling device. 4,256,286, Cl. 254-30.000.
Hughes Aircraft Company: *See*—
Colles, Joseph H., 4,257,064, Cl. 358-169.000.
Piliavin, Michael A.; and Csanky, Geza, 4,256,382, Cl. 350-334.000.
Hughes Tool Company: *See*—
Barnard, Louis H., 4,256,187, Cl. 173-119.000.
Hukki, Risto T.: *See*—
Burton, Phillip F.; and Hukki, Risto T., 4,256,267, Cl. 241-24.000.
Huntjens, Franciscus J.: *See*—
Schulze, Helmut; Zengel, Hans; Brodowski, Walter; Huntjens, Franciscus J.; Schutijser, Jan A. J.; and Hentschel, Peter, 4,256,869, Cl. 528-67.000.
Huperz, Adalbert; and Maasberg, Wolfgang, to Woma-Apparatebau. Valve assembly for high-pressure piston pump. 4,256,139, Cl. 137-512.300.
Huppunen, Robert D.; and Harriau, Robert R., to Thermatool Corp. Soldering apparatus. 4,256,252, Cl. 228-1.00A.
Hwang, Ki-Sup, to Mead Corporation, The. Cleaning composition for use in an ink jet recorder. 4,256,610, Cl. 252-542.000.
Hyde, David L.; and Kirkwood, Kenneth C., to BP Chemicals Limited. Polymerization catalyst. 4,256,865, Cl. 526-124.000.
Hydril Company: *See*—
Mott, James D., 4,256,180, Cl. 166-315.000.
Hydro-Quebec: *See*—
Belanger, Guy; and Missout, Gilles, 4,256,152, Cl. 141-70.000.
Hydrocarbon Research, Inc.: *See*—
Van Baush, Edward H., 4,256,476, Cl. 62-23.000.
I.H.C. Holland N.V.: *See*—
Verboom, Pieter, 4,255,882, Cl. 37-66.000.
Iammarino, Dominic J.: *See*—
Biszantz, Donald W.; Landers, Russell H.; Sexton, James H.; and Iammarino, Dominic J., 4,256,156, Cl. 145-33.00A.
Ibsen, Robert L.; and Glace, William R., to Den-Mat, Inc. Composition for repair of porcelain dental prostheses. 4,256,603, Cl. 252-182.000.
Ichikawa, Tetsuya: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Ick, Jurgen; Meiners, Hans J.; Oertel, Gunter; Hauptmann, Gunter; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the production of cold setting foams which contain urethane groups prepared from a mixture of 4,4-diphenyl methane diisocyanate and 2,4-diphenyl methane diisocyanate. 4,256,849, Cl. 521-129.000.
Igel, Anders N. E., to U.S. Philips Corporation. Pulse generator. 4,257,108, Cl. 364-900.000.
Ii, Nobuo: *See*—
Kimura, Shigeyuki; Shindo, Isamu; Mori, Yasumichi; Kitamura, Kenji; and Ii, Nobuo, 4,256,531, Cl. 156-620.000.
Iida, Takashi: *See*—
Yasukuni, Mitsuo; Kiten, Hiroshi; Iida, Takashi; Kawamura, Kunio; and Yoshida, Nobuo, 4,256,372, Cl. 350-444.000.
Iizumi, Katsuo: *See*—
Takayanagi, Yoshikazu; Iizumi, Katsuo; Miyazawa, Masashi; Yamaya, Nobuyuki; and Tamura, Hajime, 4,256,917, Cl. 562-562.000.
Ike, Yoshimasa: *See*—
Kojima, Atsushi; Kohno, Yoshitsugu; Ike, Yoshimasa; Yokoyama, Tatsuro; and Odate, Makoto, 4,256,885, Cl. 544-313.000.
Ikeda, Akira: *See*—
Azuma, Kenkoku; and Ikeda, Akira, 4,256,710, Cl. 423-210.000.
Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus equipped with improved braking device for scanning system. 4,256,399, Cl. 355-8.000.
Ikeda, Makoto, to R & D Office Makoto Ltd. Turn table device for record players. 4,256,312, Cl. 369-269.000.
Iki, Tetsuo: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.
Illinois Tool Works Inc.: *See*—
Genz, Earl J., 4,256,358, Cl. 339-95.00D.
Imaki, Takao: *See*—
Ishida, Kozo; Saitoh, Osamu; and Imaki, Takao, 4,256,964, Cl. 250-345.000.
Imperial Chemical Industries Limited: *See*—
Baker, Alan S., 4,256,605, Cl. 252-312.000.
Cliff, Michael J.; Cross, William T.; and Ramshaw, Colin, 4,256,551, Cl. 204-98.000.
Coaton, James R.; Rees, John M.; and Rothon, Roger N., 4,256,988, Cl. 313-221.000.
Green, Mino, 4,256,379, Cl. 350-357.000.
McOnie, Malcolm P.; and Roberts, Philip D., 4,256,863, Cl. 526-62.000.
Imperiale, Alessandro. Solar heating system. 4,256,090, Cl. 126-427.000.
Inaba, Hiromi: *See*—
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.
Inaba, Masaharu: *See*—
Konno, Takeshi; Inaba, Masaharu; and Inayama, Takayuki, 4,256,249, Cl. 226-181.000.
Inata, Hiroo; Arakawa, Tamio; and Nishihara, Toshio, to Teijin Limited. Cured or uncured linear aromatic polyester composition and process for preparation thereof. 4,256,558, Cl. 204-159.150.
Inayama, Takayuki: *See*—
Konno, Takeshi; Inaba, Masaharu; and Inayama, Takayuki, 4,256,249, Cl. 226-181.000.
Infantino, Settimio: *See*—
Cohen, Samuel W.; and Infantino, Settimio, 4,256,385, Cl. 351-13.000.
Ingram, Charles E., to Four Star Corporation. Velocity responsive deflector blade with self-alignment pivotal mounting. 4,256,339, Cl. 296-1.00S.
Inmont Corporation: *See*—
Stamper, Richard W.; and Rhonehouse, Richard L., 4,256,797, Cl. 428-215.000.
Innovative Design Company Pty. Limited: *See*—
Woinarski, Peter A., 4,256,240, Cl. 220-306.000.
Inoue, Takashi: *See*—
Yazaki, Katsuya; Inoue, Takashi; and Mori, Shohji, 4,256,687, Cl. 264-210.100.
Intek, Inc.: *See*—
Harpster, Joseph W. C., 4,255,968, Cl. 73-204.000.
Intel Corporation: *See*—
Nadir, James, 4,257,095, Cl. 364-200.000.
International Business Machines Corporation: *See*—
Barclay, Donald J.; Lowe, Anthony C.; and Martin, David H., 4,256,380, Cl. 350-357.000.
Barclay, Donald J.; and Vigar, James M. L., 4,256,548, Cl. 204-43.00R.
Magdo, Ingrid E.; and Magdo, Steven, 4,256,532, Cl. 156-628.000.
McCullough, J. Warren; Poland, Terrell A.; Reynolds, Dale N.; Slack, Keith K.; and Turner, Richard T., 4,257,096, Cl. 364-200.000.
Pogge, Hans B., 4,256,514, Cl. 148-1.500.
Shelton, Thomas F., 4,256,408, Cl. 400-124.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,256,121, Cl. 131-9.000.
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,256,776, Cl. 426-535.000.
International Minerals & Chemical Corporation: *See*—
Allen, Hanceford L.; and Berry, William W., 4,256,570, Cl. 209-5.000.
International Oil Tools, Inc.: *See*—
Shillander, Harold E., 4,256,179, Cl. 166-237.000.
International Standard Electric Corporation: *See*—
Wessel, Gerhard; Pottharst, Jurgen; and Koger, Kurt, 4,256,383, Cl. 350-343.000.

International Telephone and Telegraph Corporation: *See*—
Wallace, Charles H., 4,256,569, Cl. 209-3.300.
Interstate Industries, Inc.: *See*—
Palisek, William F., 4,256,931, Cl. 200-5.00A.
Inventa AG fur Forschung und Patentverwertung, Zurich: *See*—
Fluri, Peter; Voser, Richard; and Wettstein, Peter, 4,256,837, Cl. 435-167.000.
Inventec Licensing B.V.: *See*—
Hickman, Ronald P.; and Styman, Alan F., 4,256,294, Cl. 269-16.000.
Irani, Mazin R.: *See*—
Cassella, Vincent J.; and Irani, Mazin R., 4,256,577, Cl. 210-738.000.
Iribe, Seiki: *See*—
Ono, Takezo; Watanabe, Mineo; and Iribe, Seiki, 4,256,559, Cl. 204-180.00P.
Irimajiri, Shoichiro; and Fukui, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Oblong piston and cylinder for internal combustion engine. 4,256,068, Cl. 123-193.00P.
Iris Associates: *See*—
Carter, Philip S.; and Krumme, John F., 4,256,945, Cl. 219-10.750.
Ishida, Kozo; Saitoh, Osamu; and Imaki, Takao, to Horiba, Ltd. Gas analyzer. 4,256,964, Cl. 250-345.000.
Ishida, Takashi: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.
Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Electronic pre-emission flash device. 4,256,995, Cl. 315-241.00P.
Ishida, Toshihiko, to TDK Electronics Co., Ltd. Pressure pad and shielding plate for a tape cassette. 4,257,077, Cl. 360-130.330.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,255,951, Cl. 68-22.00R.
Ishikawa, Chuji, to Ricoh Company, Ltd. Recording apparatus. 4,257,054, Cl. 346-155.000.
Ishikawa, Michio: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katumi; Ishikawa, Michio; and Hayashi, Yuzi, 4,257,014, Cl. 331-94.5PE.
Ishizuka, Ichiro: *See*—
Makisumi, Yasuo; Murabayashi, Akira; Takase, Akira; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,256,899, Cl. 548-246.000.
Ishizuka, Natsuki: *See*—
Makisumi, Yasuo; Takada, Susumu; Sasatani, Takashi; and Ishizuka, Natsuki, 4,256,640, Cl. 260-326.12A.
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, to Toyo Soda Manufacturing Co. Ltd.; and (Zaidanhojin) Sagami Chemical Research Center. Addition compound of dipeptide derivative and amino acid derivative. 4,256,836, Cl. 435-70.000.
Issiki, Katuhito: *See*—
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.
Ito, Katsuo; Murata, Bunjiro; Yoshimura, Kazunori; and Yamaguchi, Kenichi, to Murata Manufacturing Co., Ltd. Coaxial cable connector receptacle. 4,256,935, Cl. 200-51.00R.
Ito, Masayuki; Okamoto, Giro; Machi, Sueo; and Shirayama, Kenzo, to Japan Atomic Energy Research Institute; and Sugimoto Chemical Co. Ltd. Components of uranium enrichment plant. 4,256,856, Cl. 525-331.000.
Ito, Yoshikatsu: *See*—
Matsumoto, Kenji; Hishikawa, Shintaro; and Ito, Yoshikatsu, 4,256,492, Cl. 106-22.000.
Itoga, Kiyoshi; Ogino, Fumiichi; Shirakawa, Kinichi; and Soga, Yasuyuki, to Takeda Chemical Industries, Ltd.; and Rengo Co., Ltd. Brominated carbonaceous molecular sieve and method of use therefor. 4,256,773, Cl. 426-415.000.
Itsubo, Junichi: *See*—
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Nagashima, Shigeru; and Nakamura, Kozo, 4,256,234, Cl. 215-343.000.
ITT Industries, Inc.: *See*—
Klamandt, Herbert F.; and Colley, Jacques, 4,256,235, Cl. 220-4.00F.
Kunze, Lothar; and Kahrs, Manfred, 4,256,443, Cl. 418-77.000.
Lupertz, Hans-Henning, 4,256,209, Cl. 188-218.0XL.
Riedel, Peter, 4,255,932, Cl. 60-562.000.
Ives, Kenneth D., to United States Steel Corporation. Shear plug for use in a curved roll-rack. 4,256,169, Cl. 164-448.000.
Iwanaga, Kazuyoshi: *See*—
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,255,983, Cl. 74-752.00C.
Iwasa, Hitoo: *See*—
Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, 4,256,520, Cl. 148-171.000.
Iwasaki, Hiroshi: *See*—
Kawakami, Yasushi; and Iwasaki, Hiroshi, 4,256,198, Cl. 181-141.000.
Iwata, Michiaki: *See*—
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, 4,256,744, Cl. 424-248.510.
Izon Corporation: *See*—
Masucci, Carmine, 4,257,041, Cl. 340-705.000.
J. I. Case Company: *See*—
Fralish, Mark R., 4,255,881, Cl. 37-43.00R.
King, Donald R., 4,256,433, Cl. 414-694.000.
Jackson, Denise M.; Tsuda, Yoshihisa; and Winans, Vida, to UOP Inc. Method of purification of glucose isomerase. 4,256,838, Cl. 435-234.000.
Jackson, Frank W. Fiberoptic endoscope accessory instrument storage case. 4,256,225, Cl. 206-303.000.
Jacobs, William B.: *See*—
Goodson, Louis H.; and Jacobs, William B., 4,256,985, Cl. 307-308.000.
Jaedicke, Hagen; and Paust, Joachim, to BASF Aktiengesellschaft. 3-Chloro-3-methyl-butane-1,4-dial-bis-acetals and 3-methyl-but-2-ene-1,4-dial-bis-acetals, a process for the preparation of these compounds and their use. 4,256,643, Cl. 260-340.700.
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., to AGFA-Gevaert, A.G. Photographic material containing a stabilizer. 4,256,830, Cl. 430-372.000.
Jalbing, John I.: *See*—
Smith, Jack E.; Roberts, David E.; and Jalbing, John I., 4,256,700, Cl. 422-177.000.
Janocha, Siegfried: *See*—
Gebhardt, Dieter; and Janocha, Siegfried, 4,256,784, Cl. 428-216.000.
Janzen, Samuel P., to New J Industries Ltd. Sunflower harvester attachment for combines. 4,255,920, Cl. 56-126.000.
Japan Atomic Energy Research Institute: *See*—
Ito, Masayuki; Okamoto, Giro; Machi, Sueo; and Shirayama, Kenzo, 4,256,856, Cl. 525-331.000.
Japan Crown Cork Co. Ltd.: *See*—
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Nagashima, Shigeru; and Nakamura, Kozo, 4,256,234, Cl. 215-343.000.
Japan Steel Works Ltd., The: *See*—
Kosodo, Hiroshi; Tomotsugu, Heiji; and Kudo, Hiroshi, 4,256,439, Cl. 417-216.000.
Jasperson, F. Bon. Waterproof coating composition. 4,256,804, Cl. 428-332.000.
Jassund, Steven A.: *See*—
Mazer, Marshall R.; Jassund, Steven A.; and Herman, Stewart T., 4,256,468, Cl. 55-8.000.
Jerabek, Robert D.: *See*—
Buchwalter, Stephen L.; Jerabek, Robert D.; Chou, Lee-Pei H.; and Christenson, Roger M., 4,256,560, Cl. 204-181.00C.
Jernow, Jane L.: *See*—
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,256,911, Cl. 560-227.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Horton, James A.; and Weis, John A., 4,256,962, Cl. 250-281.000.
Pike, Charles T.; Furumoto, Horace W.; and Levin, Lawrence A., 4,257,013, Cl. 331-94.50P.
Johansson, Arne I. Pressure vessel with hatch. 4,256,701, Cl. 422-242.000.
John Fluke Mfg. Co., Inc.: *See*—
Chapel, Roy W., Jr.; and Gurol, I. Macit, 4,257,061, Cl. 357-69.000.
John H. Best & Sons, Inc.: *See*—
Ovitz, Ernest G., III, 4,256,043, Cl. 108-29.000.
Johnson, Allen S., Jr. Apparatus and method for treating a gas with a liquid. 4,256,045, Cl. 110-345.000.
Johnson, Allen S., Jr. Upright kiln and attendant method for heating an aggregate material. 4,256,451, Cl. 432-14.000.
Johnson, Bruce K.; and Morse, John B., to Polaroid Corporation. Film cassette support spring. 4,256,395, Cl. 354-180.000.
Johnson, Ian M.: *See*—
Flesher, Peter; and Johnson, Ian M., 4,256,660, Cl. 260-513.00N.
Johnson, Jeffrey O., to BRS, Inc. Athletic shoe having an upper toe section of stretchable material, external reinforcing strips and improved lacing. 4,255,876, Cl. 36-83.000.
Johnson, Matthey & Co., Limited: *See*—
Sermon, Paul A., 4,256,711, Cl. 423-239.000.
Johnson, Raymond V.; and Biondi, Dennis P., to RCA Corporation. Temperature gradient means in reactor tube of vapor deposition apparatus. 4,256,052, Cl. 118-719.000.
Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Method of constructing a number of different memory systems. 4,255,852, Cl. 29-837.000.
Johnson, Robert H.; and Wilkes, Colin, to General Electric Company. Combustion control system. 4,255,927, Cl. 60-39.230.
Johnson, Robert R., to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,256,122, Cl. 131-10.00A.
Johnson, Roger N., to General Electric Company. Washing machine transmission. 4,255,952, Cl. 68-23.700.
Johnston, Loren B., to RCA Corporation. System for periodically reversing the order of video data in a flat panel display device. 4,257,068, Cl. 358-242.000.
Jones, Eugene C., to American Hospital Supply Corporation. Solvent-bonded joint. 4,256,333, Cl. 285-22.000.
Jones, Kenneth W., to Reed Tool Company. Intermittent high-drag oil well drilling methods and apparatus. 4,256,191, Cl. 175-93.000.
Jones, W. Richard; Hartman, Albert, Jr.; Conrad, Earl; and Kraig, Harry J., to Mercury Metal Products. Swingable rain cover for vertical exhaust pipes with stop means. 4,255,928, Cl. 60-324.000.
Jueschke, Alexander A.: *See*—
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,256,553, Cl. 204-106.000.

Juhnke, Klaus; and Harlos, Hartmut, to U.S. Philips Corporation. Circuit arrangement for generating a pulse with a delayed edge. 4,256,981, Cl. 307-266.000.

Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., to Northern Telecom Limited. Synthetic latex modified pulp insulated conductors. 4,256,807, Cl. 428-379.000.

Jung, John A.; and Peress, Jimmy, to Chem Systems Inc. Preparation of carboxylic acids using a BF_3 catalyst complex. 4,256,913, Cl. 562-521.000.

Jung, Wilhelm H., to AMF Incorporated. Knife mechanism for twin needle sewing apparatus. 4,256,048, Cl. 112-292.000.

Junger, Hans; and Seiler, Claus-Dieter, to Dynamit Nobel Aktiengesellschaft. Binding agents prepared from resins containing adhesivizing agents of long shelf life. 4,256,623, Cl. 260-38.000.

Jurkov, Leonid I.: *See*—
Kubasov, Vladimir L.; Jurkov, Leonid I.; Busse-Machukas, Vladimir B.; Kokhanov, Georgy N.; and Lvovich, Florenty I., 4,256,563, Cl. 204-290.00F.

Juskevic, John. Key cutting machine. 4,256,423, Cl. 409-82.000.

Kabaya, Masamichi: *See*—
Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, 4,256,503, Cl. 106-100.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Asano, Kazuhiro; and Sasaki, Seiko, 4,257,116, Cl. 368-69.000.
Kojima, Masayuki, 4,256,984, Cl. 307-296.00R.

Kabushiki Kaisha Kato Kogei: *See*—
Kato, Niro, 4,256,387, Cl. 351-90.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Mishima, Toshio, 4,256,005, Cl. 84-1.030.

Kabushiki Kaisha Meidensha: *See*—
Nogi, Teiji; and Yasuda, Takao, 4,256,934, Cl. 200-48.00R.

Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Nakata, Kiyohiro; and Suwa, Hiroaki, 4,255,861, Cl. 33-166.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Takeuchi, Akihiro; and Asai, Kiyokazu, 4,256,987, Cl. 310-316.000.

Kahrs, Manfred: *See*—
Kunze, Lothar; and Kahrs, Manfred, 4,256,443, Cl. 418-77.000.

Kai, Fumio: *See*—
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, 4,256,744, Cl. 424-248.510.

Kaiser, Ado: *See*—
Chodnekar, Madhukar S.; and Kaiser, Ado, 4,256,748, Cl. 424-251.000.

Kajiwara, Ikuo: *See*—
Hayashi, Masaki; Tanouchi, Tadao; Kawamura, Masanori; and Kajiwara, Ikuo, 4,256,757, Cl. 424-273.00R.

Kaldenbach, Erwin: *See*—
Stodt, Eberhard; and Kaldenbach, Erwin, 4,256,434, Cl. 414-786.000.

Kali-Chemie Pharma GmbH: *See*—
Thies, Peter Willibrord; and Asai, Akiji, 4,256,642, Cl. 260-340.300.

Kallenberger, Robert H., to Phillips Petroleum Company. Method for producing carbon black. 4,256,720, Cl. 423-449.000.

Kamata, Hiroshi: *See*—
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.

Kamide, Noboru: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katumi; Ishikawa, Michio; and Hayashi, Yuzi, 4,257,014, Cl. 331-94.5PE.

Kamijo, Naoyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Deflecting device for cathode-ray tube. 4,257,023, Cl. 335-211.000.

Kanamaru, Tatsuya: *See*—
Yoshida, Katsuyoshi; Higashi, Mitsuo; Kanamaru, Tatsuya; and Nakayama, Motohiro, 4,256,519, Cl. 148-156.000.

Kanamori, Kyozo: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.

Kanazawa, Tamotsu: *See*—
Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, 4,256,765, Cl. 424-315.000.

Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, to Konishiroku Photo Industry Co., Ltd. Light-sensitive photographic element comprising a magenta image dye-providing compound. 4,256,831, Cl. 430-562.000.

Kaneda, Hiroshi: *See*—
Ohashi, Takashi; Okuyama, Toru; Kaneda, Hiroshi; Taniguchi, Yoshiko; and Yoshida, Masako, 4,256,846, Cl. 521-117.000.

Kaneko, Yoshiro; and Sato, Masaru, to Sony Corporation. Channel selecting apparatus for use with signal receiver and signal recorder. 4,257,066, Cl. 358-183.000.

Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, to Konan Camera Research Institute. Eyeball examining device. 4,256,384, Cl. 351-7.000.

Kano, Masafumi: *See*—
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,256,805, Cl. 428-357.000.

Kansai Paint Co., Ltd.: *See*—
Tazuke, Shigeo; Kimura, Hitoshi; and Nakayama, Hiroyuki, 4,256,782, Cl. 427-53.100.

Kao Soap Co., Ltd.: *See*—
Yoshida, Etuji, 4,256,174, Cl. 165-.27..

Kapp, John P.; Robertson, James T.; and Tucker, Elton M. Arterial pressure control system. 4,256,094, Cl. 128-24.00R.

Karasudani, Yasuo, to Tokico Ltd. Disc brake. 4,256,207, Cl. 188-72.700.

Karayannis, Nicholas M.; and Lee, Sam S., to Standard Oil Company (Indiana). Polymerization process. 4,256,866, Cl. 526-142.000.

Karl Marbach GmbH, Firma: *See*—
Marbach, Karl, 4,256,026, Cl. 493-404.000.

Karl Mayer Textil-Maschinenfabrik GmbH: *See*—
Kohl, Karl, 4,255,947, Cl. 66-84.00A.

Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co.: *See*—
Strauss, Werner; and Lenzer, Xaver, 4,256,431, Cl. 414-505.000.

Karlsson, Alf H.; Lundstrom, Hans E.; and Olsson, Lars-Henrik, to SCA Development Aktiebolag. Method of manufacturing cellulose derivative. 4,256,877, Cl. 536-59.000.

Karplus, Henry H. B., to United States of America, Energy. Digital pressure transducer for use at high temperatures. 4,255,973, Cl. 73-704.000.

Karrer, Friedrich: *See*—
Moser, Paul; Rody, Jean; and Karrer, Friedrich, 4,256,627, Cl. 260-45.75N.

Kasper, Rudolph: *See*—
Schwabe, William E.; Elsner, Emil; and Kasper, Rudolph, 4,256,918, Cl. 13-11.000.

Kataoka, Masayuki: *See*—
Shimokai, Katzujiro; Kataoka, Masayuki; and Funamoto, Akihiko, 4,256,621, Cl. 260-29.7NR.

Katayama, Hajime: *See*—
Komori, Shigehiro; and Katayama, Hajime, 4,256,400, Cl. 355-14.0SH.

Katkov, Jury V. Piston stroke adjusting arrangement for disc-type friction clutches and brakes. 4,256,211, Cl. 192-111.00R.

Kato, Jyoji: *See*—
Hayashi, Kimiaki; Kato, Jyoji; Uchida, Tomofumi; and Yoneda, Naoto, 4,256,751, Cl. 424-258.000.

Kato, Makoto; and Hazue, Masaaki, to Nihon Medi+Physics Co., Ltd. ^{99m}Tc-Labeled radioactive diagnostic agent, and non-radioactive carrier therefor. 4,256,726, Cl. 424-1.000.

Kato, Niro, to Kabushiki Kaisha Kato Kogei. Device for connecting lugs on metal rim of spectacle frame. 4,256,387, Cl. 351-90.000.

Kato, Yoshio: *See*—
Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, 4,256,842, Cl. 521-53.000.
Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, 4,256,843, Cl. 521-53.000.

Katoh Electric Machinery Co., Ltd.: *See*—
Suzuki, Nobuo, 4,256,310, Cl. 369-217.000.

Katoh, Tatuya: *See*—
Enomoto, Takamichi; Katoh, Tatuya; Kozima, Akio; and Satoh, Tatsumi, 4,256,821, Cl. 430-59.000.

Katoh, Yoshiaki: *See*—
Takahashi, Sadao; and Katoh, Yoshiaki, 4,256,963, Cl. 250-296.000.

Kaufman, Howard H.: *See*—
Kopf, J. David; Seiler, William, Jr.; Palecki, Gerald S.; and Kaufman, Howard H., 4,256,112, Cl. 128-303.00B.

Kaufman, Lance R. Electrical power converter thyristor firing circuit having noise immunity. 4,257,091, Cl. 363-85.000.

Kavchok, Ronald W.: *See*—
Papalos, John G.; and Kavchok, Ronald W., 4,256,871, Cl. 528-265.000.

Kawaguchi, Hiroshi: *See*—
Kubo, Masaaki; Onodera, Yasutaka; Kawaguchi, Hiroshi; and Sibata, Masaharu, 4,256,342, Cl. 299-7.000.

Kawaguchi, Taizo; and Kobayashi, Haruo, to Minolta Camera Kabushiki Kaisha. Camera viewfinder device. 4,256,396, Cl. 354-222.000.

Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, to Honda Giken Kogyo Kabushiki Kaisha. Wheels for vehicles, such as motorcycles. 4,256,346, Cl. 301-64.0SH.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,256,003, Cl. 84-1.010.

Kawakami, Yasushi; and Iwasaki, Hiroshi, to Nissan Motor Company, Limited. Acoustic apparatus. 4,256,198, Cl. 181-141.000.

Kawamata, Shigeru; and Tsukuda, Kiyoshi, to Hitachi, Ltd. Semiconductor switch. 4,257,060, Cl. 357-49.000.

Kawamura, Hiromitsu; Misumi, Akira; and Odawara, Kozo, to Hitachi, Ltd. Sealing glass. 4,256,495, Cl. 106-53.000.

Kawamura, Kunio: *See*—
Yasukuni, Mitsuo; Kiten, Hiroshi; Iida, Takashi; Kawamura, Kunio; and Yoshida, Nobuo, 4,256,372, Cl. 350-444.000.

Kawamura, Masanori: *See*—
Hayashi, Masaki; Tanouchi, Tadao; Kawamura, Masanori; and Kajiwara, Ikuo, 4,256,757, Cl. 424-273.00R.

Kawamura, Yoshimi; Shoji, Jun'ichi; and Matsumoto, Kouichi, to Shionogi & Co., Ltd. Process for preparing cephamycin C. 4,256,835, Cl. 435-48.000.

Kawanobe, Kouhei: *See*—
Hatuse, Toshikazu; Natori, Minoru; Shimazaki, Toshikazu; Kawanobe, Kouhei; and Ogawa, Hiroshi, 4,257,115, Cl. 368-69.000.

Kawasaki Steel Corporation: *See*—
Yoshioka, Keiichi; Kinoshita, Noboru; Ono, Yutaka; and Ohashi, Nobuo, 4,256,486, Cl. 75-125.000.

Kazacos, Maria S.; and Miller, Barry, to Bell Telephone Laboratories, Incorporated. Method of making metal-chalcogenide photosensitive devices. 4,256,544, Cl. 204-2.100.
Kazda, Stanislav: *See*—
Horstmann, Harald; Bossert, Friedrich; Heise, Arend; and Kazda, Stanislav, 4,256,749, Cl. 424-251.000.
Keeley, Charles: *See*—
Brecker, Lawrence R.; and Keeley, Charles, 4,256,618, Cl. 260-23.0XA.
Keiser, Dennis L.; and Ariel, Gideon B. Variable resistance exercising device. 4,256,302, Cl. 272-118.000.
Kelly, Donald A. Manifold hydrogen generator units for automotive I.C. engines. 4,256,060, Cl. 123-3.000.
Kelly, Robert C.; and Wierenga, Wendell, to Upjohn Company, The. α(substituted) Amino-3-substituted-2-isoxazoline-5-acetic acids (esters). 4,256,898, Cl. 548-240.000.
Kemerer, W. James: *See*—
Vassar, Clyde W., 4,256,685, Cl. 264-167.000.
Kemmner, Ulrich: *See*—
Rose, Klaus; Kemmner, Ulrich; and Ringwald, Peter, 4,256,579, Cl. 210-90.000.
Kemper, James M.; and Tilly, Lynn K., to AMSTED Industries Incorporated. Damping railway truck friction shoe. 4,256,041, Cl. 105-197.0DB.
Kenjesky, Raymond J.: *See*—
Scholten, Dale A.; Schreiner, Frederick J.; Kenjesky, Raymond J.; and Bartlett, Kenneth E., 4,256,082, Cl. 126-110.0AA.
Keritsis, Gus D.: *See*—
Lendvay, Andrew T.; Wakeham, Helmut R. R.; and Keritsis, Gus D., 4,256,123, Cl. 131-17.00A.
Seligman, Robert B.; and Keritsis, Gus D., 4,256,126, Cl. 131-17.00A.
Kern, Calvin V., to Eltra Corporation. Starter assembly utilizing a castellated cup. 4,255,982, Cl. 74-7.00R.
Kern, Johann; and Eichner, Walter, to Lang Apparatebau GmbH. Liquid dosing apparatus. 4,256,440, Cl. 417-391.000.
Kerner, Ronald E. Method of radius and angle dressing. 4,255,905, Cl. 51-325.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Divisek, Jiri; and Mergel, Jurgen, 4,256,549, Cl. 204-60.000.
Keystone Consolidated Industries, Inc.: *See*—
Davis, James P., 4,256,032, Cl. 100-26.000.
Khattak, Chandra P.: *See*—
Schmid, Frederick; and Khattak, Chandra P., 4,256,530, Cl. 156-600.000.
Khromov, Vladimir I.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Kogos, Aizik M.; Rymarenko, Leonid I.; Makeev, Igor M.; and Pasechnik, Nikolai V., 4,255,957, Cl. 72-279.000.
Kidani, Yoshinori; and Noji, Masahide, to Kidani, Yoshinori. Platinum complex. 4,256,652, Cl. 260-429.00R.
Kiencke, Uwe: *See*—
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.
Kihara, Keiichi: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Kii, Masami, to Mitsubishi Denki Kabushiki Kaisha. Gas-blast type circuit interrupter. 4,256,940, Cl. 200-148.00R.
Kikuchi, Motokazu: *See*—
Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, 4,256,503, Cl. 106-100.000.
Killebrew, Wilbur N., Jr.: *See*—
Stewart, Charles M.; and Killebrew, Wilbur N., Jr., 4,257,105, Cl. 364-501.000.
Kimberly-Clark Corporation: *See*—
Lassen, Frederick O., 4,256,111, Cl. 128-284.000.
Kimmel, Robert M. Warning lantern adapter. 4,257,085, Cl. 362-186.000.
Kimmon Electric Co., Ltd.: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katumi; Ishikawa, Michio; and Hayashi, Yuzi, 4,257,014, Cl. 331-94.5PE.
Kimura, Hiroyuki: *See*—
Fukushima, Isao; Kimura, Hiroyuki; and Nishijima, Hideo, 4,256,975, Cl. 307-543.000.
Kimura, Hitoshi: *See*—
Tazuke, Shigeo; Kimura, Hitoshi; and Nakayama, Hiroyuki, 4,256,782, Cl. 427-53.100.
Kimura, Shigeyuki; Shindo, Isamu; Mori, Yasumichi; Kitamura, Kenji; and Ii, Nobuo, to National Institute for Researches in Inorganic Materials. Process for producing single crystal of yttrium-iron garnet or solid solution thereof. 4,256,531, Cl. 156-620.000.
Kindel, Erik L., to LKB-Produkter AB. Device for breaking a glass plate so as to obtain a sharp edge. 4,256,246, Cl. 225-103.000.
King, Donald R., to J. I. Case Company. Hydraulic circuit for earth-working implement. 4,256,433, Cl. 414-694.000.
King-Seeley Thermos Co.: *See*—
Lanzani, Emanuele, 4,255,942, Cl. 62-348.000.
Kinoshita, Noboru: *See*—
Yoshioka, Keiichi; Kinoshita, Noboru; Ono, Yutaka; and Ohashi, Nobuo, 4,256,486, Cl. 75-125.000.
Kinoshita, Tsukuru; Ogata, Yuzuru; and Suzue, Masayoshi, to Otsuka Chemical Co., Ltd. Process for preparing crystalline phosphonitrilic chloride oligomers. 4,256,715, Cl. 423-300.000.
Kirby, Donald J. Bat construction for a harvester reel. 4,255,921, Cl. 56-220.000.
Kirkwood, Kenneth C.: *See*—
Hyde, David L.; and Kirkwood, Kenneth C., 4,256,865, Cl. 526-124.000.
Kirner, Ernest O.; and Devensky, Walter L., to Bendix Corporation, The. Digital remote control system. 4,257,031, Cl. 340-149.00R.
Kirschner, Jurgen: *See*—
Zajicek, Otmar; Kirschner, Jurgen; Klapp, Helmut; and Rompeltien, Rainer, 4,256,470, Cl. 55-48.000.
Kiser, Cecil M., Jr., to NEP Sales, Inc. Cruise control. 4,256,197, Cl. 180-335.000.
Kissei Pharmaceutical Co., Ltd.: *See*—
Hayashi, Masaki; Tanouchi, Tadao; Kawamura, Masanori; and Kajiwara, Ikuo, 4,256,757, Cl. 424-273.00R.
Kitajima, Masao: *See*—
Kondo, Asaji; and Kitajima, Masao, 4,256,693, Cl. 422-56.000.
Kitamura, Kenji: *See*—
Kimura, Shigeyuki; Shindo, Isamu; Mori, Yasumichi; Kitamura, Kenji; and Ii, Nobuo, 4,256,531, Cl. 156-620.000.
Kitaura, Mashio, to Minolta Camera Kabushiki Kaisha. Flash responsive exposure time control system. 4,256,391, Cl. 354-33.000.
Kitayama, Shoji; Okamitsu, Hiroaki; Nakatani, Motohiko; and Shibata, Toshiroh, to Sumitomo Metal Industries Limited. Apparatus for automatically fitting runner bricks. 4,256,428, Cl. 414-121.000.
Kitchka, Paul E.: *See*—
Verduin, Lee C.; and Kitchka, Paul E., 4,256,009, Cl. 84-464.00R.
Kite, Oliver A.: *See*—
Garrett, Michael E.; and Kite, Oliver A., 4,256,575, Cl. 210-629.000.
Kiten, Hiroshi: *See*—
Yasukuni, Mitsuo; Kiten, Hiroshi; Iida, Takashi; Kawamura, Kunio; and Yoshida, Nobuo, 4,256,372, Cl. 350-444.000.
Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,256,121, Cl. 131-9.000.
Klamandt, Herbert F.; and Colley, Jacques, to ITT Industries, Inc. Drum for laundry handling machine. 4,256,235, Cl. 220-4.00F.
Klapp, Helmut: *See*—
Zajicek, Otmar; Kirschner, Jurgen; Klapp, Helmut; and Rompeltien, Rainer, 4,256,470, Cl. 55-48.000.
Klarman, Wallace, to Tara Materials, Inc. Artist canvas stretcher frame brace bracket. 4,255,886, Cl. 38-102.300.
Klaus, Michael J.; and Pawson, Beverly A., to Hoffmann-La Roche Inc. Polyene compounds. 4,256,878, Cl. 542-412.000.
Klieman, Kenneth J., to Berwind Corporation. Drop-weight material level indicator. 4,255,859, Cl. 33-126.600.
Kliklok Corporation: *See*—
Goda, Boyd D.; Simpson, Thomas E.; St. Vincent, Craig J.; and Collura, Peter C., 4,256,025, Cl. 493-160.000.
Klingspor, Bengt G. E., to AB Eiser. Sock. 4,255,819, Cl. 2-239.000.
Klockner Stahltechnik GmbH: *See*—
Redetzky, Manfred, 4,256,134, Cl. 137-118.000.
Klomp, Joseph H.: *See*—
de Bruin, Jan; and Klomp, Joseph H., 4,256,030, Cl. 99-295.000.
Kloster, Kenneth D. Self-threading nut. 4,256,421, Cl. 408-221.000.
Knape, R. U. B.: *See*—
Froschauer, L. E.; Knape, R. U. B.; and Schmidt, D. H., 4,256,686, Cl. 264-209.000.
Knapp, Randy O., to Champion Spark Plug Company. Lead-free glaze for alumina bodies. 4,256,497, Cl. 106-48.000.
Kniazzeh, Alfredo G., to Polaroid Corporation. Method and apparatus for manufacturing battery vents and vented batteries. 4,256,813, Cl. 429-86.000.
Knox, Howard T.; and McAtee, James E., to Ancra Corporation. Rattle-proof anchor fitting for securing loads to a retainer track. 4,256,424, Cl. 410-105.000.
Kobashi, Kyoichi: *See*—
Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, 4,256,765, Cl. 424-315.000.
Kobashi, Mamoru; and Ogawa, Toshihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of controlling ignition timing of an internal combustion engine. 4,256,073, Cl. 123-422.000.
Kobayashi, Haruo: *See*—
Kawaguchi, Taizo; and Kobayashi, Haruo, 4,256,396, Cl. 354-222.000.
Kobayashi, Katsuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Holding structure for a drive shaft in a vehicle of rear wheel independent suspension type. 4,255,943, Cl. 64-21.000.
Kobayashi, Ryuichiro: *See*—
Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, 4,256,831, Cl. 430-562.000.
Kobayashi, Shunsuke; Miyaji, Akira; and Nara, Yoshio, to Nippon Kogaku K.K. Electro-optical display element. 4,256,376, Cl. 350-336.000.
Kobayashi, Takehiro: *See*—
Tsujimoto, Susumu; Yamazaki, Hayao; Ozaki, Masayoshi; and Kobayashi, Takehiro, 4,256,127, Cl. 132-9.000.

Kobayashi, Tatsuhiko: *See*—
Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, 4,256,831, Cl. 430-562.000.
Kobayashi, Yasuhisa: *See*—
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, 4,256,346, Cl. 301-64.0SH.
Kochanski, Aloysius J.; Mowery, Frank D.; and Hire, Charles J., to Hi-Stat Manufacturing Company, Inc. Pressure switch and circuit means. 4,256,973, Cl. 307-118.000.
Kocks Technik GmbH & Co.: *See*—
Zacharias, Theodor, 4,255,956, Cl. 72-225.000.
Kocsis nee Bagyi, Maria: *See*—
Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, 4,256,481, Cl. 71-88.000.
Koda, Hirokazu: *See*—
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, 4,256,047, Cl. 112-158.00E.
Koehler, Charles E.; McClellan, Thomas R.; and Murray, Pat L., to Upjohn Company, The. Process for polyisocyanurate foams suitable for panels. 4,256,802, Cl. 428-310.000.
Koehler Manufacturing Company: *See*—
Gulliksen, John E., 4,257,086, Cl. 362-279.000.
Koenig, Neale F.: *See*—
Perica, Jacob E.; Poyer, Wayne F.; and Koenig, Neale F., 4,256,117, Cl. 128-690.000.
Koepke, Barry G.; and McHenry, Kelly D., to Honeywell Inc. Composite electronic substrate of alumina uniformly needled through with aluminum nitride. 4,256,792, Cl. 428-119.000.
Koger, Kurt: *See*—
Wessel, Gerhard; Pottharst, Jurgen; and Koger, Kurt, 4,256,383, Cl. 350-343.000.
Kogos, Aizik M.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Kogos, Aizik M.; Rymarenko, Leonid I.; Makeev, Igor M.; and Pasechnik, Nikolai V., 4,255,957, Cl. 72-279.000.
Kohl, Karl, to Karl Mayer Textil-Maschinenfabrik GmbH. Warp knitting machine with weft insertion apparatus. 4,255,947, Cl. 66-84.00A.
Kohler, Emil K., to Bibrach & Rehberg. Process for the manufacture of refractory ware. 4,256,498, Cl. 106-55.000.
Kohler, Gunter A.: *See*—
McAllister, Jerome W.; Kohler, Gunter A.; and Lund, Virtudes R., 4,256,694, Cl. 422-58.000.
Kohno, Yoshitsugu: *See*—
Kojima, Atsushi; Kohno, Yoshitsugu; Ike, Yoshimasa; Yokoyama, Tatsuro; and Odate, Makoto, 4,256,885, Cl. 544-313.000.
Kohsaka, Yohji: *See*—
Ouchi, Chiaki; and Kohsaka, Yohji, 4,256,516, Cl. 148-12.00R.
Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, to Matsushita Electric Industrial Co., Ltd. Etching of gallium stains in liquid phase epitoxy. 4,256,520, Cl. 148-171.000.
Koizumi, Yasunori: *See*—
Yamamoto, Satoshi; Hirae, Toshiyuki; and Koizumi, Yasunori, 4,256,591, Cl. 252-12.000.
Kojima, Atsushi; Kohno, Yoshitsugu; Ike, Yoshimasa; Yokoyama, Tatsuro; and Odate, Makoto, to Mitsui Toatsu Kagaku Kabushiki Kaisha. Process for the preparation of 1-(2-tetrahydrofuryl)-5-fluorouracil. 4,256,885, Cl. 544-313.000.
Kojima, Masayuki, to Kabushiki Kaisha Daini Seikosha. Interlevel interface for series powered IIL or SITL. 4,256,984, Cl. 307-296.00R.
Kokhanov, Georgy N.: *See*—
Kubasov, Vladimir L.; Jurkov, Leonid I.; Busse-Machukas, Vladimir B.; Kokhanov, Georgy N.; and Lvovich, Florenty I., 4,256,563, Cl. 204-290.00F.
Kokiso, Masakazu: *See*—
Tarumi, Noriyoshi; Tamura, Akihiko; Kokiso, Masakazu; Muramatsu, Toshio; and Nagayasu, Koichi, 4,256,822, Cl. 430-62.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Ota, Chuichi; Seki, Norio; and Sakaguchi, Haruo, 4,257,033, Cl. 340-870.160.
Yokoi, Hiroshi; and Shiokawa, Takayasu, 4,257,048, Cl. 343-709.000.
Komaromy, Zsigmond: *See*—
Blickle, Tibor; Komaromy, Zsigmond; Filka, Judit; Gyenis, Janos; and Borlai, Oszkar, 4,256,576, Cl. 62-538.000.
Komatsu, Hideo: *See*—
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.
Komiya, Katsuo: *See*—
Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, 4,256,842, Cl. 521-53.000.
Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, 4,256,843, Cl. 521-53.000.
Komori, Shigehiro; and Katayama, Hajime, to Canon Kabushiki Kaisha. Copying machine provided with means for selectively setting original base line. 4,256,400, Cl. 355-14.0SH.
Konagaya, Masahiko: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,256,384, Cl. 351-7.000.
Konan Camera Research Institute: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,256,384, Cl. 351-7.000.
Kondo, Asaji; and Kitajima, Masao, to Fuji Photo Film Co., Ltd. Multilayered integral chemical analysis element for the blood. 4,256,693, Cl. 422-56.000.
Konig, Klaus: *See*—
Ick, Jurgen; Meiners, Hans J.; Oertel, Gunter; Hauptmann, Gunter; and Konig, Klaus, 4,256,849, Cl. 521-129.000.
Koninklijke Fabriek Inventum Fabriek van instrumenter en elektrische apparaten N.V.: *See*—
de Bruin, Jan; and Klomp, Joseph H., 4,256,030, Cl. 99-295.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, 4,256,831, Cl. 430-562.000.
Tarumi, Noriyoshi; Tamura, Akihiko; Kokiso, Masakazu; Muramatsu, Toshio; and Nagayasu, Koichi, 4,256,822, Cl. 430-62.000.
Konno, Takeshi; Inaba, Masaharu; and Inayama, Takayuki, to Fuji Photo Film Co., Ltd. Photographing film conveying device. 4,256,249, Cl. 226-181.000.
Kopf, J. David; Seiler, William, Jr.; Palecki, Gerald S.; and Kaufman, Howard H., to David Kopf Instruments. Head positioner. 4,256,112, Cl. 128-303.00B.
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, to Boehringer Ingelheim GmbH. 1-Aryloxy-2-hydroxy-3-[(substituted phenyl-donidazalidinon-2-yl)-alkyl-amino]-propanes and salts thereof. 4,256,756, Cl. 424-273.00R.
Korf-Stahl AG: *See*—
Schwabe, William E.; Elsner, Emil; and Kasper, Rudolph, 4,256,918, Cl. 13-11.000.
Korshunov, Petr E.: *See*—
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.
Kosodo, Hiroshi; Tomotsugu, Heiji; and Kudo, Hiroshi, to Japan Steel Works Ltd., The. Power control system for multiple pumps. 4,256,439, Cl. 417-216.000.
Kostin, Ivan M.: *See*—
Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M., 4,256,709, Cl. 423-119.000.
Kothe, Dieter, to DEMAG, Aktiengesellschaft. Cooling spray nozzle adjusting arrangement particularly for steel strand casting plants. 4,256,168, Cl. 164-444.000.
Kovach, Julius L. Process for preparing porous metal oxide beads. 4,256,676, Cl. 264-0.500.
Kovacs, David: *See*—
Trutner, Donald G.; Kovacs, David; Fontana, Raymond P.; and Thorington, Luke, 4,256,989, Cl. 313-318.000.
Kovacs, Jozsef M. Temporary shelter. 4,255,912, Cl. 52-79.800.
Kowa Company, Limited: *See*—
Yokoo, Nobuo; and Mori, Toshihito, 4,256,631, Cl. 260-112.00B.
Kozar, Robert S., to AMSTED Industries Incorporated. Waste oil recovery process. 4,256,578, Cl. 210-766.000.
Kozima, Akio: *See*—
Enomoto, Takamichi; Katoh, Tatuya; Kozima, Akio; and Satoh, Tatsumi, 4,256,821, Cl. 430-59.000.
Kozlowski, Peter F., to A. W. Chesterton Company. Braided packing and method and apparatus for making packing. 4,256,011, Cl. 87-6.000.
Kraft, Dennis, to Bunker Ramo Corporation. Pressure equalization system. 4,256,699, Cl. 422-166.000.
Kraig, Harry J.: *See*—
Jones, W. Richard; Hartman, Albert, Jr.; Conrad, Earl; and Kraig, Harry J., 4,255,928, Cl. 60-324.000.
Kramer, Charles J., Jr.; and Seachman, Ned J., to Xerox Corporation. Piezo-optic, total internal reflection modulator. 4,257,016, Cl. 332-7.510.
Kranz, Joachim; Polster, Rudolf; Sappok, Reinhard; and Wiesenberger, Alois, to BASF Aktiengesellschaft. Pigment formulations. 4,256,507, Cl. 106-288.00Q.
Krause, Walter O.: *See*—
Grahl, Darwin R.; and Krause, Walter O., 4,255,940, Cl. 62-324.300.
Kreitzer, Melvyn H., to Vivitar Corporation. Zoom lens. 4,256,381, Cl. 350-423.000.
Kreonite Inc: *See*—
Russold, Frank J., 4,256,001, Cl. 83-869.000.
Krimsky, Leonard C.: *See*—
Lee, Frank X.; and Krimsky, Leonard C., 4,256,270, Cl. 242-75.500.
Krisp, Werner; Malkowski, Rainer; and Reuss, Mira. Denture cleansing tablet and process for making. 4,256,599, Cl. 252-99.000.
Kroger, Dietrich, to Grumag Geraete- und Maschinen GmbH. Piston vibrator. 4,256,014, Cl. 91-216.00B.
Kroger, Hans; Muller, Wolfgang; and Denzinger, Wolfgang, to Dornier System GmbH. Circuit for defined current sharing between parallel-connected switching regulator modules in DC switching regulators. 4,257,090, Cl. 363-65.000.
Kroplinski, Thaddeus F.; and Case, Barton C., to NL Industries, Inc. Catalyzed non-toxic polyurethane forming compositions and separatory devices employing the same. 4,256,617, Cl. 260-18.0TN.
Krueger, Hans; and Pink, Hans, to Siemens Aktiengesellschaft. Process for producing homeotropic orientation layers for liquid crystal devices and the resultant liquid crystal devices. 4,256,377, Cl. 350-340.000.

Krumme, John F.: *See—*
Carter, Philip S.; and Krumme, John F., 4,256,945, Cl. 219-10.750.

Kruse, Richard W.: *See—*
Rowe, Murray A.; Conway, Robert T.; Glesmann, Herbert C.; and Kruse, Richard W., 4,256,415, Cl. 404-116.000.

Kubasov, Vladimir L.; Jurkov, Leonid I.; Busse-Machukas, Vladimir B.; Kokhanov, Georgy N.; and Lvovich, Florenty I. Electrode for electrochemical processes and production method therefor. 4,256,563, Cl. 204-290.00F.

Kubo, Masaaki; Onodera, Yasutaka; Kawaguchi, Hiroshi; and Sibata, Masaharu, to Mitsubishi Mining & Cement Co., Ltd. Dragline equipped with hopper means and loading means. 4,256,342, Cl. 299-7.000.

Kubota, Ltd.: *See—*
Sugiyama, Shiro, 4,256,432, Cl. 414-694.000.

Kucheryavy, Vladimir I.: *See—*
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.

Kuder, James E.: *See—*
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, 4,256,818, Cl. 430-39.000.

Kudo, Hiroshi: *See—*
Kosodo, Hiroshi; Tomotsugu, Heiji; and Kudo, Hiroshi, 4,256,439, Cl. 417-216.000.

Kuhl, Peter J.: *See—*
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,256,529, Cl. 156-515.000.

Kuhnel, Werner: *See—*
Gehrke, Gunter; Kuhnel, Werner; and Kuth, Robert, 4,256,460, Cl. 8-532.000.

Kumazawa, Toshihiko: *See—*
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,256,604, Cl. 252-188.30R.

Kummer, Rene: *See—*
Osinski, Ulrich; and Kummer, Rene, 4,256,679, Cl. 264-51.000.

Kummer, Rudolf; Schneider, Heinz-Walter; Weiss, Franz-Josef; and Lemann, Otto, to BASF Aktiengesellschaft. Preparation of dimethyl butanedicarboxylates. 4,256,909, Cl. 560-204.000.

Kunkel, Heinrich; Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, to Sandvik Ab, Fack & Aktiebolaget SKF. Rotary drill bit with rotary cutter. 4,256,193, Cl. 175-371.000.

Kunz, Paul. Method for cooking food in a pressure vessel. 4,256,775, Cl. 426-508.000.

Kunze, Lothar; and Kahrs, Manfred, to ITT Industries, Inc. Rotary vane-type engine throttle channels communicating between adjacent working spaces. 4,256,443, Cl. 418-77.000.

Kunzel, Werner: *See—*
Cioc, Alexander; Kunzel, Werner; and Meyer, Klaus, 4,256,231, Cl. 215-1.00C.

Kuo, Samuel C., to GTE Products Corporation. Periodically loaded antenna structure. 4,257,049, Cl. 343-792.500.

Kurima, Akinori: *See—*
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.

Kurkovskaya, Violetta V.: *See—*
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.

Kuroda, Takao: *See—*
Nakamura, Michiharu; Yamashita, Shigeo; Kuroda, Takao; and Umeda, Jun-ichi, 4,257,011, Cl. 331-94.50H.

Kuroha, Hiroaki: *See—*
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.

Kuroishi, Shoji: *See—*
Fujimura, Itaru; Nakamura, Hitoshi; Kuroishi, Shoji; Seko, Nachio; and Ogawa, Toshiyuki, 4,256,401, Cl. 355-14.00E.

Kurokawa, Tadashi: *See—*
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,256,766, Cl. 424-319.000.

Kurosawa, Toshiaki: *See—*
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.

Kusters, Eduard; and Hartmann, Werner, to Kusters, Eduard. Paper calender and its operation. 4,256,034, Cl. 100-38.000.

Kuth, Robert: *See—*
Gehrke, Gunter; Kuhnel, Werner; and Kuth, Robert, 4,256,460, Cl. 8-532.000.

Kuwabara, Yasuo: *See—*
Horiba, Isao; Kuwabara, Yasuo; Takagi, Hiroshi; and Satou, Shigeru, 4,257,102, Cl. 364-414.000.

Kyowa Electric & Chemical Co., Ltd.: *See—*
Hirota, Kashichi, 4,256,224, Cl. 206-203.000.

L. & C. Steinmuller GmbH: *See—*
Schuster, Ernst, 4,256,539, Cl. 201-9.000.

La Nationale S.A.: *See—*
Beyer, Karl, 4,256,388, Cl. 351-158.000.

Labbe, Francis A. M., to Molins Limited. Cigarette making machine. 4,256,125, Cl. 131-66.00R.

Laboratorios Bago S.A.: *See—*
Los, Mario A., 4,256,760, Cl. 424-279.000.

LaBrecque, John F. Lighting unit for flight toy or the like. 4,255,895, Cl. 46-228.000.

Lackman, Leslie M.; and Hill, John A., to Rockwell International Corporation. Reinforced composite structure and method of fabrication thereof. 4,256,790, Cl. 428-73.000.

Lacko, Lorant, Sr. Split rim tire changer. 4,256,162, Cl. 157-1.280.

Lacroix, Rene J.: *See—*
Treheux, Michel E.; and Lacroix, Rene J., 4,256,927, Cl. 179-18.00E.

Lacy, Robert H., to Phillips Petroleum Company. Computer to recording medium interface. 4,257,098, Cl. 364-200.000.

Laesser, Claude: *See—*
Meister, Rene; and Laesser, Claude, 4,257,113, Cl. 368-35.000.

Lafarge Conseils et Etudes: *See—*
Lovichi, Jean-Pierre; LeBras, Bernard; Guyot, Robert; and Guilmin, Francois, 4,256,502, Cl. 106-100.000.

Lagowski, Joseph V.: *See—*
Black, Sigmund; Lagowski, Joseph V.; Whitt, Jerry C.; and Plumley, Roger D., 4,256,343, Cl. 299-31.000.

Laimer, Friedrich: *See—*
Neuner, Ludwig; and Laimer, Friedrich, 4,256,289, Cl. 266-159.000.

Lain, Ronald G., to RWC, Inc. Workpiece assembly machinery. 4,256,221, Cl. 198-345.000.

Lakshminarayana, Mysore R.: *See—*
Partain, Larry D.; and Lakshminarayana, Mysore R., 4,257,001, Cl. 324-58.50C.

Lamadrid, Rene G.; and Cullis, Herbert M., to Baxter Travenol Laboratories, Inc. Improved pressure plate movement system for a peristaltic pump. 4,256,442, Cl. 417-477.000.

Lamaziere, Jacques, to Societe Francaise pour le Developpement de l'Automatisme en Biologie. Device for simultaneous transfer of a plurality of liquids. 4,256,153, Cl. 141-84.000.

Lamb, Reginald T. Apparatus for digitizing optical images. 4,257,071, Cl. 358-286.000.

Lamb, Sydney M.; and Smith, Randall C., to Semionics Associates, Inc. Recognition memory with multiwrite and masking. 4,257,110, Cl. 365-49.000.

Lambert, Robert D. Method and apparatus for electromechanically retro-fitting a conventional automatic screw machine to accept numerical control. 4,255,991, Cl. 82-1.00C.

Lambert, William R. Method for shucking scallops. 4,255,834, Cl. 17-48.000.

Lancaster, Jesse F., to Dynatech Laboratories, Inc. Electrical jack and patch cord assemblies. 4,256,936, Cl. 200-51.070.

Lancaster, Patrick R.; and Lancaster, William G., to Lantech Inc. Collapsible web apparatus. 4,255,918, Cl. 53-556.000.

Lancaster, William G.: *See—*
Lancaster, Patrick R.; and Lancaster, William G., 4,255,918, Cl. 53-556.000.

Landa, Benzion, to Savin Corporation. Method of electrophotography using low intensity exposive. 4,256,820, Cl. 430-54.000.

Landers, Russell H.: *See—*
Biszantz, Donald W.; Landers, Russell H.; Sexton, James H.; and Iammarino, Dominic J., 4,256,156, Cl. 145-33.00A.

Landsness, Clifford A., to B. F. Goodrich Company, The. Dusting apparatus. 4,256,051, Cl. 118-107.000.

Lang Apparatebau GmbH: *See—*
Kern, Johann; and Eichner, Walter, 4,256,440, Cl. 417-391.000.

Langbein-Pfanhauser Werke AG: *See—*
Brugger, Robert, 4,256,546, Cl. 204-33.000.

Langford, James W., Jr., to Dresser Industries, Inc. Sealing system for a rolling cone cutter earth boring bit. 4,256,351, Cl. 308-8.200.

Lantech Inc.: *See—*
Lancaster, Patrick R.; and Lancaster, William G., 4,255,918, Cl. 53-556.000.

Lanzani, Emanuele, to King-Seeley Thermos Co. Automatic self-contained ice cube machine. 4,255,942, Cl. 62-348.000.

Lapp, James F.; and McGrath, Thomas F., to Acme Visible Records, Inc. Apparatus and method for feeding and collecting continuous web material. 4,256,248, Cl. 226-118.000.

Lappa, Cleto L. Two cycle rotary internal combustion engine and cylinder sealing ring arrangement therefor. 4,256,061, Cl. 123-44.00D.

Larker, Hans: *See—*
Adlerborn, Jan; Larker, Hans; and Nilsson, Jan, 4,256,688, Cl. 264-325.000.

Larson, Ellis; and Olsson, Burton K., to CR Industries. Mechanical end face seal with dirt excluder lip. 4,256,315, Cl. 277-92.000.

Larson, Myles A.: *See—*
Flick, Edward A.; Holmes, Timothy R.; and Larson, Myles A., 4,256,275, Cl. 244-3.190.

Larsson, Bjorn E.; and Desiderio, Fred A., to Rohm and Haas Company. Ambient or low-temperature curable coatings for leather and other flexible substrates. 4,256,809, Cl. 428-473.000.

Laskin, Allen I.: *See—*
Naslund, Lars A.; and Laskin, Allen I., 4,256,590, Cl. 252-8.55D.

Lassen, Frederick O., to Kimberly-Clark Corporation. Filaments of chemically modified cellulose fibers and webs and products formed therefrom. 4,256,111, Cl. 128-284.000.

Laube, Hilmar: *See—*
Tybus, Gerd; and Laube, Hilmar, 4,256,412, Cl. 403-267.000.

Laurent, Florent: *See—*
Savey, Claude; and Laurent, Florent, 4,256,803, Cl. 428-315.000.

Lautzenhiser, Theodore V., to Standard Oil Company. Ring laser gravity gradiometer. 4,255,969, Cl. 73-382.00G.
Lazaroff, Gary G. Liquid control system spray washer. 4,255,950, Cl. 68-18.00F.
Lazzaretti, Louis, to Gladwin Corporation. Continuous casting mold taper gage. 4,255,863, Cl. 33-174.00E.
Leahey, John J.; Muetterties, Andrew J.; and Genese, Joseph N., to Abbott Laboratories. Equipment sets having reduced diameter primary tube for the sequential administration of medical liquids at dual flow rates. 4,256,105, Cl. 128-214.00G.
Lear Siegler, Inc.: *See*—
Scholten, Dale A.; Schreiner, Frederick J.; Kenjesky, Raymond J.; and Bartlett, Kenneth E., 4,256,082, Cl. 126-110.0AA.
Lebedev, Vladimir V.: *See*—
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.
LeBlanc, Conrad, to DRG Limited. Method and apparatus for setting fastener elements into a blank. 4,256,250, Cl. 227-17.000.
LeBras, Bernard: *See*—
Lovichi, Jean-Pierre; LeBras, Bernard; Guyot, Robert; and Guilmin, Francois, 4,256,502, Cl. 106-100.000.
Lechner, Uwe: *See*—
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.
LeCong, Phung: *See*—
Newhouse, Vernon L.; and LeCong, Phung, 4,255,977, Cl. 73-861.250.
Lectron Products, Inc.: *See*—
Slavin, Michael; and Telmet, Juhan, 4,257,036, Cl. 340-388.000.
Lee, Frank X.; and Krimsky, Leonard C., to Worldwide Converting Machinery, Inc. Tension control system for an unwinder. 4,256,270, Cl. 242-75.500.
Lee, Lawrence L., to Magnavox Government and Industrial Electronics Co. Apparatus and method for making small spheres. 4,256,677, Cl. 264-8.000.
Lee, Sam S.: *See*—
Karayannis, Nicholas M.; and Lee, Sam S., 4,256,866, Cl. 526-142.000.
Lee, Shi C., to Chunzu Machinery Industry Co., Ltd. Automatic safety mechanism for forming machines. 4,255,955, Cl. 72-31.000.
Lee, Steven N., to Rockwell International Corporation. Boat for wafer processing. 4,256,229, Cl. 211-41.000.
LeGrys, Geoffrey A.: *See*—
Solomons, Gerald L.; and LeGrys, Geoffrey A., 4,256,839, Cl. 435-314.000.
Legue, Norris R., to Synthetic Surfaces, Inc. Adhesive consisting essentially of a ricinoleate urethane polyol and a chlorinated rubber. 4,256,615, Cl. 260-18.0TN.
Lehmann, Heinz: *See*—
Streller, Bernd; and Lehmann, Heinz, 4,256,397, Cl. 354-250.000.
Leiber, Heinz; and Mergenthaler, Robert, to Robert Bosch GmbH. Hydraulic brake booster for a vehicular brake system. 4,255,931, Cl. 60-547.00A.
Leimgruber, Willy: *See*—
Batcho, Andrew D.; Hengartner, Urs O.; Leimgruber, Willy; Scott, John W.; and Valentine, Donald, Jr., 4,256,641, Cl. 260-326.14T.
Leinweber, Robert L., to Eaton Corporation. Torsion type tandem suspension. 4,256,327, Cl. 280-684.000.
Leitgeb, Paul, to Linde Aktiengesellschaft. Repressurization technique for pressure swing adsorption. 4,256,469, Cl. 55-25.000.
Leitold, Matyas: *See*—
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,256,747, Cl. 424-250.000.
Lemann, Otto: *See*—
Kummer, Rudolf; Schneider, Heinz-Walter; Weiss, Franz-Josef; and Lemann, Otto, 4,256,909, Cl. 560-204.000.
Lemesle, Marcel E.; Guibert, Marcel H.; and Le Moing, Claude A. Optical fibre coupler. 4,256,365, Cl. 350-96.180.
Lemmer, Alfred. Component-insertion table for printed wiring boards. 4,256,220, Cl. 198-778.000.
Le Moing, Claude A.: *See*—
Lemesle, Marcel E.; Guibert, Marcel H.; and Le Moing, Claude A., 4,256,365, Cl. 350-96.180.
Lendvay, Andrew T.; Wakeham, Helmut R. R.; and Keritsis, Gus D., to Philip Morris Incorporated. Smokable material containing thermally degraded tobacco by-products and its method of preparation. 4,256,123, Cl. 131-17.00A.
Lennartz, Rudiger, to Boll & Kirch Filterbau GmbH. Flush-back filter. 4,256,583, Cl. 210-333.100.
Lenzer, Xaver: *See*—
Strauss, Werner; and Lenzer, Xaver, 4,256,431, Cl. 414-505.000.
Lesea, Austin H.: *See*—
Lesea, Ronald A.; Luttge, Barrie; and Lesea, Austin H., 4,256,928, Cl. 179-18.0BE.
Lesea, Ronald A.; Luttge, Barrie; and Lesea, Austin H., to Durango Systems, Inc. Telephone call diverting and answering system. 4,256,928, Cl. 179-18.0BE.
Lester Industries, Inc.: *See*—
Lester, Thomas J.; and Ptacek, Theodore C., 4,256,348, Cl. 301-64.00R.
Lester, Thomas J.; and Ptacek, Theodore C., to Lester Industries, Inc. Aluminum alloy motorcycle wheel having an extruded rim shrink fitted and resin bonded to a die cast hub-spoke unit. 4,256,348, Cl. 301-64.00R.
LeVeen, Harry H. Treatment with dialdehydes. 4,256,768, Cl. 424-333.000.
Levene, Gerald. Camber aligning tool. 4,255,865, Cl. 33-336.000.
Levin, Lawrence A.: *See*—
Pike, Charles T.; Furumoto, Horace W.; and Levin, Lawrence A., 4,257,013, Cl. 331-94.50P.
Levin, Yehuda; and Sela, Ben-Ami, to Yeda Research and Development Co. Ltd. Novel derivatives of daunomycin. 4,256,632, Cl. 260-112.50R.
Levine, Ernest N.: *See*—
Baumann, Stephen F.; Nakabayashi, Masahiro; Uttrachi, Gerald D.; Coless, Thomas L.; and Levine, Ernest N., 4,256,949, Cl. 219-146.240.
Levinstein, Hyman J.; and Wang, David N., to Bell Telephone Laboratories, Incorporated. Device fabrication by plasma etching. 4,256,534, Cl. 156-643.000.
Levy, Donald; and Rusz, Tibor, to Rule Medical Instruments, Inc. Flow control equipment. 4,256,100, Cl. 128-204.210.
Lewis, Daniel M.: *See*—
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,256,553, Cl. 204-106.000.
Lewis, Raymond H., Jr.; and Carr, James B. Drain down freeze prevention control system for a solar collector. 4,256,089, Cl. 126-420.000.
Lewis, Ronald G.; and Pavelek, Joseph M., to Greyhound Corp., The. Translucent soap bar containing citronellyl esters as lime soap dispersants. 4,256,600, Cl. 252-132.000.
Lianza, Thomas A., to Eikonix Corporation. Graphical representation transducing. 4,256,969, Cl. 250-566.000.
Lifetime Industries: *See*—
Atkins, Jack; and Cayce, William E., 4,256,472, Cl. 55-269.000.
Lightell, Wilbur G. Inflatable storm window. 4,255,907, Cl. 52-2.000.
Lin, Youlin, to Mallinckrodt, Inc. N,N'-Bis-(2,3-dihydroxypropyl)-2,4,6-triiodo-5-(2-keto-L-gulonamido)isophthalamide and radiological compositions containing same. 4,256,729, Cl. 424-5.000.
Linde Aktiengesellschaft: *See*—
Leitgeb, Paul, 4,256,469, Cl. 55-25.000.
Lindemann, Eckhard; Broning, Jorg; and Asbach, Dietrich, to Dr.-Ing. Rudolf Hell GmbH, Firma. Electronic pattern generator. 4,257,042, Cl. 340-716.000.
Lindemann Maschinenfabrik GmbH: *See*—
Stodt, Eberhard; and Kaldenbach, Erwin, 4,256,434, Cl. 414-786.000.
Lindmayer, Joseph, to Semix Incorporated. Method of producing semicrystalline silicon. 4,256,681, Cl. 264-85.000.
Lindsay, Donald S.; Menk, Charles J.; and Popelish, John A., to General Electric Company. Apparatus and method for driving a magnetic print head. 4,257,051, Cl. 346-74.500.
Lindstrom, Roald E.: *See*—
Flynn, Charles M., Jr.; Carnahan, Thomas G.; and Lindstrom, Roald E., 4,256,707, Cl. 423-42.000.
Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., 4,256,705, Cl. 423-27.000.
Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., 4,256,706, Cl. 423-29.000.
Line, Howard C. Method and system for generating heat. 4,256,085, Cl. 126-247.000.
Ling, Hans G.: *See*—
Simons, Michael J.; Southby, David T.; and Ling, Hans G., 4,256,881, Cl. 544-132.000.
Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Insecticidal agents. 4,256,754, Cl. 424-269.000.
Lipsky, Stephen E., to General Instrument Corporation. Method and apparatus for electrically scanning an antenna array in a monopulse DF radar system. 4,257,047, Cl. 343-120.000.
Lita: *See*—
Vasseur, Bernard; and Boucaut, Alain, 4,256,357, Cl. 339-21.00R.
Livak, Ronald J., to Swiss Aluminium Ltd. Al-Mg-Si Extrusion alloy. 4,256,488, Cl. 75-142.000.
Ljung, Bo H. G., to Singer Company, The. Ring laser gyroscope anode. 4,257,015, Cl. 331-94.50D.
LKB-Produkter AB: *See*—
Kindel, Erik L., 4,256,246, Cl. 225-103.000.
Loch, Emil; and Mendolia, Frank J., to Westinghouse Electric Corp. Method of repairing a heating element in a pressurizer. 4,255,840, Cl. 29-157.00R.
Lockheed Corporation: *See*—
Cowart, William L.; Holland, Cropper W., Jr.; and Scarbrough, Don R., Sr., 4,256,012, Cl. 89-1.816.
Loepfe, Erich, to Gebruder Loepfe AG. Device for monitoring yarn motion on a textile machine. 4,256,247, Cl. 226-45.000.
Logan, Corrigan D., to Roll-A-Vision, Inc. Changeable display. 4,255,889, Cl. 40-518.000.
Loge, Olaf: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,256,745, Cl. 424-248.550.
Logic Devices, Inc.: *See*—
Allen, Paul E., 4,256,953, Cl. 235-92.00T.
Lohrentz, Howard R.: *See*—
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., 4,255,985, Cl. 74-479.000.
Loix, Gilbert. Double extendible or support ladder. 4,256,200, Cl. 182-22.000.

Longo, Joseph T.: *See*—
Cheung, Derek T.; Andrews, A. Mike, II; and Longo, Joseph T., 4,257,057, Cl. 357-24.000.
Longoni, Angelo: *See*—
Boschi, Pier M.; Gozzo, Franco; and Longoni, Angelo, 4,256,902, Cl. 548-365.000.
Lonsinger, Jack J.: *See*—
Barton, Danny B.; Halbleib, Chester W.; and Lonsinger, Jack J., 4,256,661, Cl. 564-18.000.
Loprest, Frank J., to GAF Corporation. Photographic element and photographic record prepared therefrom. 4,256,825, Cl. 430-142.000.
Lord, John; and Gellert, Jobst U., to Mold-Masters Limited. Injection molding filter assembly. 4,256,584, Cl. 210-446.000.
Los, Mario A., to Laboratorios Bago S.A. Methods of treating mammals suffering from inflammation and pain. 4,256,760, Cl. 424-279.000.
Loughry, H. Hampton; and Zeewy, Abraham, to Ham Industries, Inc. Video monitoring system and method. 4,257,063, Cl. 358-108.000.
Lovas, Kurt: *See*—
Reisser, Gerd; and Lovas, Kurt, 4,256,272, Cl. 242-18.0PW.
Love, Jim: *See*—
Dietsche, Thomas J.; and Love, Jim, 4,256,894, Cl. 546-345.000.
Lovichi, Jean-Pierre; LeBras, Bernard; Guyot, Robert; and Guilmin, Francois, to Lafarge Conseils et Etudes. Method of preparing cement clinker from carboniferous shale. 4,256,502, Cl. 106-100.000.
Lowe, Anthony C.: *See*—
Barclay, Donald J.; Lowe, Anthony C.; and Martin, David H., 4,256,380, Cl. 350-357.000.
Lu, Chin H., to Xerox Corporation. Method using positively charged electrophotographic toner containing amido dialkyl hydroxy ammonium compound. 4,256,824, Cl. 430-122.000.
Lubrizol Corporation, The: *See*—
Cohen, Jerome M., 4,256,596, Cl. 252-52.00R.
Rysek, Joseph J., 4,256,594, Cl. 252-49.900.
Lucerne Products, Inc.: *See*—
Wied, Julius P., 4,256,942, Cl. 200-157.000.
Lucian, A. D., deceased (by Lucian, Betty J., Administrator), to United States of America, Navy. High energy fluoroscopic screen. 4,256,965, Cl. 250-367.000.
Lucian, Betty J., Administrator: *See*—
Lucian, A. D., deceased, 4,256,965, Cl. 250-367.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., to Beecham Group Limited. Antibacterial compounds. 4,256,762, Cl. 424-283.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., to Beecham Group Limited. Esters of monic and isomonic acids. 4,256,879, Cl. 542-427.000.
Luk Lamellen und Kupplungsbau GmbH: *See*—
Dubiel, Oswald; and Pretzel, Dieter, 4,256,210, Cl. 192-99.00A.
Lund, Virtudes R.: *See*—
McAllister, Jerome W.; Kohler, Gunter A.; and Lund, Virtudes R., 4,256,694, Cl. 422-58.000.
Lundstrom, Hans E.: *See*—
Karlsson, Alf H.; Lundstrom, Hans E.; and Olsson, Lars-Henrik, 4,256,877, Cl. 536-59.000.
Luparello, Pietro: *See*—
Busacca, Guido; Luparello, Pietro; and Meli, Vincenzo, 4,256,990, Cl. 315-39.610.
Lupertz, Hans-Henning, to ITT Industries, Inc. Axially displaceable brake disc. 4,256,209, Cl. 188-218.0XL.
Luttenberger, Johann: *See*—
Aigner, Hansjorg; Behmel, Klaus; and Luttenberger, Johann, 4,256,620, Cl. 260-29.6HN.
Luttge, Barrie: *See*—
Lesea, Ronald A.; Luttge, Barrie; and Lesea, Austin H., 4,256,928, Cl. 179-18.0BE.
Luursema, Meerten, to U.S. Philips Corporation. Electric device for starting and feeding a metal vapor discharge lamp provided with a preheatable electrode. 4,256,992, Cl. 315-106.000.
Lvovich, Florenty I.: *See*—
Kubasov, Vladimir L.; Jurkov, Leonid I.; Busse-Machukas, Vladimir B.; Kokhanov, Georgy N.; and Lvovich, Florenty I., 4,256,563, Cl. 204-290.00F.
Lyaudet, Georges; and Vial, Jean, to Compagnie Generale des Matieres Nucleaires (Cogema). Process for the separation of uranium contained in an alkaline liquor. 4,256,702, Cl. 423-7.000.
Lybecker, G. Wayne. Cable or chain actuated chip conveyor. 4,256,219, Cl. 198-747.000.
M. Lowenstein & Sons, Inc.: *See*—
Franklin, Arthur H., 4,256,149, Cl. 139-453.000.
M. S. Willett, Inc.: *See*—
Gerben, Ralph D.; and Walters, Harry J., 4,256,218, Cl. 198-621.000.
Ma-West, Inc.: *See*—
Yool, George M., 4,257,003, Cl. 324-78.00D.
Maag Gear-Wheel & Machine Company, Limited: *See*—
Sigg, Hans, 4,255,981, Cl. 74-665.00A.
Maasberg, Wolfgang: *See*—
Huperz, Adalbert; and Maasberg, Wolfgang, 4,256,139, Cl. 137-512.300.
Mabu, Osamu: *See*—
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.
Macdonell, Gary D., to Phillips Petroleum Company. Polymer inhibition. 4,256,903, Cl. 549-87.000.
Machi, Sueo: *See*—
Ito, Masayuki; Okamoto, Giro; Machi, Sueo; and Shirayama, Kenzo, 4,256,856, Cl. 525-331.000.
Mackie, Malcolm. Utility knife attachment. 4,255,856, Cl. 30-293.000.
Madan, Bhim S., to General Electric Company. Rotary cutter blade. 4,256,265, Cl. 241-92.000.
Maehara, Toshifumi, to Akebono Brake Industry Company, Ltd. Disc brake. 4,256,206, Cl. 188-71.900.
Maekawa, Yuzo: *See*—
Sekiya, Fukuo; and Maekawa, Yuzo, 4,257,114, Cl. 368-62.000.
Magalhaes, Gustavo. Process to obtain anathase concentrates from an anathase ore. 4,256,266, Cl. 241-20.000.
Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Method for making a silicon mask. 4,256,532, Cl. 156-628.000.
Magdo, Steven: *See*—
Magdo, Ingrid E.; and Magdo, Steven, 4,256,532, Cl. 156-628.000.
Maggi, Sergio, to Texas Instruments Incorporated. Four clock phase N-channel MOS gate. 4,256,976, Cl. 307-583.000.
Magill, Robert J.; and Field, Sydney J., to Actionair Equipment Limited. Shut-off damper. 4,256,143, Cl. 137-601.000.
Magnani, Carla, to Elettromeccanica Mausoli S.r.l. Safety device for opening of revolving doors. 4,255,900, Cl. 49-141.000.
Magnavox Government and Industrial Electronics Co.: *See*—
Lee, Lawrence L., 4,256,677, Cl. 264-8.000.
Magnetic Peripherals Inc.: *See*—
Goss, Lloyd C., 4,257,074, Cl. 360-78.000.
Magnetoplan H. Jo. Holtz: *See*—
Holtz, Herman, 4,255,837, Cl. 24-243.00R.
Magolda, Ronald L.: *See*—
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., 4,256,883, Cl. 544-235.000.
Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezet: *See*—
Blickle, Tibor; Komaromy, Zsigmond; Filka, Judit; Gyenis, Janos; and Borlai, Oszkar, 4,256,576, Cl. 62-538.000.
Mahler, Oscar; and Furberg, Lars, to AB Mahler & Soner. Combination plough. 4,255,878, Cl. 37-42.0VL.
Maier, Roland: *See*—
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.
Makeev, Igor M.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Kogos, Aizik M.; Rymarenko, Leonid I.; Makeev, Igor M.; and Pasechnik, Nikolai V., 4,255,957, Cl. 72-279.000.
Makisumi, Yasuo; Takada, Susumu; Sasatani, Takashi; and Ishizuka, Natsuki, to Shionogi & Co., Ltd. Tetrahydrothiopyrano[2,3-b]indole derivatives. 4,256,640, Cl. 260-326.12A.
Makisumi, Yasuo; Murabayashi, Akira; Takase, Akira; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, to Shionogi & Co., Ltd. Process for the production of 3-amino-5-t-butylisoxazole. 4,256,899, Cl. 548-246.000.
Malburg, Werner; and Mohr, Friedbert, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Nozzle assembly for gas-dynamic high efficiency lasers. 4,257,012, Cl. 331-94.50D.
Malhotra, Sudarshan K.; and Ricks, Michael J., to Dow Chemical Company, The. Substituted phenoxy and phenylthio pyridine methanols and substituted methanols. 4,256,893, Cl. 546-301.000.
Malkowski, Rainer: *See*—
Krisp, Werner; Malkowski, Rainer; and Reuss, Mira, 4,256,599, Cl. 252-99.000.
Malley, Arthur, to Research Corporation. Modified grass pollen antigens. 4,256,732, Cl. 424-91.000.
Mallinckrodt, Inc.: *See*—
Benner, Roland G.; and Henson, Paul D., 4,256,669, Cl. 564-434.000.
Lin, Youlin, 4,256,729, Cl. 424-5.000.
Malmquist, Lars, to Svenska Traforskningsinstitutet. Method of hot-air drying. 4,255,870, Cl. 34-35.000.
Man Bo Inc.: *See*—
Choe, Pil Y., 4,256,933, Cl. 200-34.000.
Manassen, Joost: *See*—
Avigal, Yitzhak; Cahen, David; Hodes, Gary; and Manassen, Joost, 4,256,814, Cl. 429-111.000.
Manchester, Luther L., Jr.: *See*—
Reneau, Bobby J.; and Manchester, Luther L., Jr., 4,256,283, Cl. 251-62.000.
Manion, Francis M.: *See*—
Tippetts, Thomas B.; and Manion, Francis M., 4,256,015, Cl. 91-364.000.
Manley, Douglas C. Implement for cleaning the feet. 4,256,409, Cl. 401-24.000.
Mannesmann Aktiengesellschaft: *See*—
von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, 4,256,165, Cl. 164-147.000.
Marantz, Laurence B.: *See*—
McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., 4,256,718, Cl. 423-419.00P.
Marbach, Karl, to Karl Marbach GmbH, Firma. Machine tool for stamping and grooving. 4,256,026, Cl. 493-404.000.
Marenco, Gerard: *See*—
Brunet, Roger; and Marenco, Gerard, 4,256,049, Cl. 114-77.00R.
Marie, Gilbert, to Ato Chimie. Process for separating isotactic and atactic polypropylenes. 4,256,874, Cl. 528-486.000.
Mark Controls Corporation: *See*—
Sekiya, George W., 4,256,258, Cl. 236-94.000.

Markano, Richard L. Fruit collector for hillside orchards. 4,256,212, Cl. 193-7.000.

Marmet, Melvin L.: *See*—
Padgett, Clarence W.; and Marmet, Melvin L., 4,256,974, Cl. 307-475.000.

Marsing, Helmut: *See*—
Beck, Kurt, deceased; Beck, Christa, heir; Beck, by Thomas, heir; Beck, Matthias, heir; and Marsing, Helmut, 4,255,849, Cl. 29-599.000.

Martelli, Louis P.: *See*—
Boisset, Michel L.; and Martelli, Louis P., 4,256,334, Cl. 285-247.000.

Martin, David H.: *See*—
Barclay, Donald J.; Lowe, Anthony C.; and Martin, David H., 4,256,380, Cl. 350-357.000.

Martin, Larry R.; and Marzalek, Michael S., to Hewlett-Packard Company. Apparatus for spectrum analysis of an electrical signal. 4,257,104, Cl. 364-485.000.

Martin, Patrick H.; Schrader, Paul G.; and Stringham, Robert R., to Dow Chemical Company, The. Fire retardant, thermosetting, resinous reaction products of phosphoric acid and methyol- or alkoxymethyl-substituted epoxides. 4,256,844, Cl. 521-59.000.

Marzalek, Michael S.: *See*—
Martin, Larry R.; and Marzalek, Michael S., 4,257,104, Cl. 364-485.000.

Marzoli, Angelo, to F.lli Marzoli & C. S.p.A. Sectional scaffolding for spinning, twisting and like frames. 4,255,925, Cl. 57-304.000.

Marzoli, Angelo, to F.lli Marzoli & C. S.p.A. Lubricating device for rotary rings of spinning and twisting frames. 4,256,202, Cl. 184-7.00A.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Fauvel, Gunter, 4,256,178, Cl. 165-165.000.
Hirt, Dieter, 4,256,065, Cl. 123-90.110.

Maschinenfabrik Gehring K.G.: *See*—
Richter, Gunter; and Froschle, Reinhard, 4,256,999, Cl. 318-560.000.

Maschinenfabrik Hennecke GmbH: *See*—
Osinski, Ulrich; and Kummer, Rene, 4,256,679, Cl. 264-51.000.

Masdea, Arturo; and Quagliarello, Giuseppe, to Selenia Industrie Elettroniche Associate S.p.A. Automatic tuning circuits for voltage controlled filters, by digital phase control. 4,257,018, Cl. 333-17.00R.

Masel, Marvin, to Otis Elevator Company. Self-adjusting elevator leveling apparatus and method. 4,256,203, Cl. 187-29.00R.

Maslov, Sergei A.: *See*—
Bljumberg, Erna A.; Maslov, Sergei A.; Emanuel, Nikolai M.; Merzhanov, Alexandr G.; and Borovinskaya, Inna P., 4,256,650, Cl. 260-348.330.

Massachusetts Institute of Technology: *See*—
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., 4,256,787, Cl. 428-1.000.

Massie, Philip E. Axial gear trains. 4,255,988, Cl. 74-800.000.

Masucci, Carmine, to Izon Corporation. Electro optical display device. 4,257,041, Cl. 340-705.000.

Masuda, Yutaka; and Ota, Seisaku, to Yamaha Hatsudori Kabushiri Kaisha. Lubricant oil level detecting device for internal combustion engines. 4,256,069, Cl. 123-196.00S.

Masyc A.G.: *See*—
Gunti, Rolf, 4,256,222, Cl. 198-457.000.

Mathew, Chempolil T.; and Pickens, Donald, to Allied Chemical Corporation. Removing aqueous ammonium sulfate from oxime product. 4,256,668, Cl. 564-255.000.

Mathias, Paul, to Mathis Systemtechnik GmbH. Positionally adjustable storing and conveying apparatus for mortar and similar substances. 4,256,217, Cl. 198-536.000.

Mathis Systemtechnik GmbH: *See*—
Mathias, Paul, 4,256,217, Cl. 198-536.000.

Matsuda, Gunji: *See*—
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Nagashima, Shigeru; and Nakamura, Kozo, 4,256,234, Cl. 215-343.000.

Matsuda, Toshio: *See*—
Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, 4,256,520, Cl. 148-171.000.

Matsumoto, Ikuo: *See*—
Naruse, Tunehide; and Matsumoto, Ikuo, 4,256,852, Cl. 525-6.000.

Matsumoto, Jun; Tanigaki, Akira; Ohsato, Nobuyoshi; Tokuda, Nobuhiko; and Tanaka, Keihachiro, to Nippon Sheet Glass Co., Ltd. Method for forming stable high-velocity gas stream. 4,256,478, Cl. 65-5.000.

Matsumoto, Kenji; Hishikawa, Shintaro; and Ito, Yoshikatsu, to Taihei Chemicals Ltd.; and Matsumoto Textile & Chemical Consultants Co. Marker ink for writing board. 4,256,492, Cl. 106-22.000.

Matsumoto, Kouichi: *See*—
Kawamura, Yoshimi; Shoji, Jun'ichi; and Matsumoto, Kouichi, 4,256,835, Cl. 435-48.000.

Matsumoto Textile & Chemical Consultants Co.: *See*—
Matsumoto, Kenji; Hishikawa, Shintaro; and Ito, Yoshikatsu, 4,256,492, Cl. 106-22.000.

Matsuo, Takehiko: *See*—
Takahashi, Teruomi; and Matsuo, Takehiko, 4,256,823, Cl. 430-66.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, 4,256,520, Cl. 148-171.000.
Naitou, Takao; and Tsuzuki, Toshio, 4,256,238, Cl. 221-263.000.
Yoshida, Manabu; Fukuchi, Jun; and Takayanagi, Shigetoshi, 4,256,513, Cl. 136-256.000.

Matsushita Electric Works Ltd.: *See*—
Sauer, Hans; Steinbichler, Wolf; Ritter, Heinz; and Antonitsch, Sepp, 4,257,081, Cl. 361-156.000.

Matsushita Reiki Co., Ltd.: *See*—
Nozawa, Kenji, 4,256,593, Cl. 252-49.800.

Mattel, Inc.: *See*—
Gross, Raymond J.; and Buscho, Lane M., 4,256,306, Cl. 273-85.00R.

Matty, Thomas C.: *See*—
Prines, Frank J.; Matty, Thomas C.; and Franz, James H., 4,257,092, Cl. 363-124.000.

Maurer, Manfred; Orth, Winfried; and Fickert, Werner, to Rutgerswerke Aktiengesellschaft. Preparation of bis-2-pyridyl-disulfides. 4,256,892, Cl. 546-261.000.

Maxs AG: *See*—
Greutert, Albert, 4,256,585, Cl. 210-474.000.

Mayer, William N., to Modern Controls, Inc. Method of constructing layered glass display panels. 4,256,533, Cl. 156-633.000.

Mazer, Marshall R.; Jassund, Steven A.; and Herman, Stewart T., to Bethlehem Steel Corporation. Method for cleaning sinter plant gas emissions. 4,256,468, Cl. 55-8.000.

MCA Discovision, Inc.: *See*—
Mickleson, Lee, 4,256,374, Cl. 350-472.000.

McAllister, Jerome W.; Kohler, Gunter A.; and Lund, Virtudes R., to Minnesota Mining and Manufacturing Company. Carbon monoxide monitoring system. 4,256,694, Cl. 422-58.000.

McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., to Organon Teknika Corporation. Sodium zirconium carbonate compound and the method of its preparation. 4,256,718, Cl. 423-419.00P.

McAtee, James E.: *See*—
Knox, Howard T.; and McAtee, James E., 4,256,424, Cl. 410-105.000.

McBride, Paul R. Vehicle trunk mounted fifth wheel trailer hitch. 4,256,323, Cl. 280-423.00R.

McCaulou, Robert L. Tire stud remover. 4,255,842, Cl. 29-235.000.

McClellan, Thomas R.: *See*—
Koehler, Charles E.; McClellan, Thomas R.; and Murray, Pat L., 4,256,802, Cl. 428-310.000.

McClelland, Gene E.: *See*—
Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., 4,256,705, Cl. 423-27.000.
Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., 4,256,706, Cl. 423-29.000.

McClure, Richard J., to Eastman Technology, Inc. Method of forming electrical components over magnetic images. 4,256,781, Cl. 427-47.000.

McComas, Charles C.: *See*—
Sokol, Larry S.; McComas, Charles C.; and Hanna, Earl M., 4,256,779, Cl. 427-34.000.

McConnell, Lorne D.: *See*—
Garzon, Ruben D.; McConnell, Lorne D.; and Votta, Gerald A., 4,256,939, Cl. 200-147.00R.

McCullough, J. Warren; Poland, Terrell A.; Reynolds, Dale N.; Slack, Keith K.; and Turner, Richard T., to International Business Machines Corporation. Synchronous and conditional inter-program control apparatus for a computer system. 4,257,096, Cl. 364-200.000.

McCutchen, James E. Console support bracket. 4,256,280, Cl. 248-220.200.

McDaniel, David C., to Nordson Corporation. Method for applying a hot melt adhesive pattern to a moving substrate. 4,256,526, Cl. 156-295.000.

McDonald, Hector O.: *See*—
Soboroff, David M.; and McDonald, Hector O., 4,256,557, Cl. 204-149.000.

McDougal, Allan R.: *See*—
United States of America, National Aeronautics and Space Administration; and McDougal, Allan R., 4,255,929, Cl. 60-517.000.

McEntire, Edward E., to Texaco Development Corporation. Preparation of β-aminopropionamides. 4,256,665, Cl. 564-135.000.

McEntire, Edward E., to Texaco Development Corporation. Preparation of β-aminopropionamides. 4,256,666, Cl. 564-135.000.

McGrath, Thomas F.: *See*—
Lapp, James F.; and McGrath, Thomas F., 4,256,248, Cl. 226-118.000.

McHenry, Kelly D.: *See*—
Koepke, Barry G.; and McHenry, Kelly D., 4,256,792, Cl. 428-119.000.

McHugh, John E. Treatment of herpes simplex infections and acne. 4,256,763, Cl. 424-285.000.

McKay, Dwight L.: *See*—
Roberts, John S.; Bertus, Brent J.; and McKay, Dwight L., 4,256,564, Cl. 208-120.000.

McKibben, Charlton K.: *See*—
Treharne, Richard W.; McKibben, Charlton K.; Moles, Donald R.; and Bruce, Mitchell R. M., 4,256,967, Cl. 250-544.000.

McKinney, James D.: *See*—
Bend, John R.; Eling, Thomas E.; and McKinney, James D., 4,256,646, Cl. 260-345.80P.

McLaughlin, Donald W.: *See*—
Funderburk, Tim; and McLaughlin, Donald W., 4,257,120, Cl. 370-62.000.

McLaughlin, Hugh D., Jr., to Pennwalt Corporation. Fluoroborate complex composition and method for cleaning aluminum at low temperatures. 4,256,602, Cl. 252-142.000.

McLaughlin, Jimmy E.: *See*—
Crowley, Donald J.; and McLaughlin, Jimmy E., 4,255,818, Cl. 2-51.000.
McLennan, Richard E. Anti-snag hook. 4,256,338, Cl. 294-82.00R.
McMickle, Robert L.; Ader, Gary B.; and Grice, Steven L., to Berkley and Company, Inc. Portable rotary snow thrower. 4,255,880, Cl. 37-43.00B.
McNeil Laboratories, Inc.: *See*—
Umen, Michael J., 4,256,891, Cl. 546-234.000.
McNutt, Michael J.: *See*—
Soohoo, Jack E.; McNutt, Michael J.; Yao, Shi-Kay; Hayes, Cecil L.; and Gudmundsen, Richard A., 4,257,111, Cl. 365-114.000.
McOnie, Malcolm P.; and Roberts, Philip D., to Imperial Chemical Industries Limited. Vinyl halide polymerization process, reactor therefor and coating product for use in process and with reactor. 4,256,863, Cl. 526-62.000.
McQuillan, Philip J. Board game apparatus. 4,256,309, Cl. 273-258.000.
McWhorter, Sharon L.: *See*—
Harris, Linda D.; Paretti, Frank J.; and McWhorter, Sharon L., 4,256,281, Cl. 248-231.000.
Mead Corporation, The: *See*—
Hwang, Ki-Sup, 4,256,610, Cl. 252-542.000.
Monette, William A., 4,256,959, Cl. 250-235.000.
Stoneburner, Leonard G., 4,257,052, Cl. 346-75.000.
Mecafina S.A.: *See*—
Rimmele, Karl, 4,256,580, Cl. 210-151.000.
Meiji Seika Kaisha, Ltd.: *See*—
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, 4,256,744, Cl. 424-248.510.
Meiners, Hans J.: *See*—
Ick, Jurgen; Meiners, Hans J.; Oertel, Gunter; Hauptmann, Gunter; and Konig, Klaus, 4,256,849, Cl. 521-129.000.
Meisel, Fritz, to Messrs. Leonhard Kurz. Blocking foil. 4,256,794, Cl. 428-195.000.
Meister, Rene; and Laesser, Claude, to Ebauches S.A. Electromechanical calendar timepiece. 4,257,113, Cl. 368-35.000.
Meitzner, Erich F.; and Oline, James A., to Rohm and Haas Company. Macroreticular cation exchange beads and preparation of same. 4,256,840, Cl. 521-33.000.
Meli, Vincenzo: *See*—
Busacca, Guido; Luparello, Pietro; and Meli, Vincenzo, 4,256,990, Cl. 315-39.610.
Menager, Olivier: *See*—
Coussot, Gerard; Menager, Olivier; and Van Den Driessche, Michel, 4,257,021, Cl. 333-195.000.
Mendenhall, Robert L. Asphalt composition for asphalt recycle. 4,256,506, Cl. 106-280.000.
Mendolia, Frank J.: *See*—
Loch, Emil; and Mendolia, Frank J., 4,255,840, Cl. 29-157.00R.
Menk, Charles J.: *See*—
Lindsay, Donald S.; Menk, Charles J.; and Popelish, John A., 4,257,051, Cl. 346-74.500.
Mentrup, Anton: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,256,756, Cl. 424-273.00R.
Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,256,758, Cl. 424-274.000.
Durette, Philippe L.; and Shen, Tsung-Ying, 4,256,735, Cl. 424-177.000.
Novello, Frederick C.; and Baldwin, John J., 4,256,887, Cl. 544-333.000.
Shepard, Kenneth L.; and Brenner, Daniel G., 4,256,889, Cl. 546-63.000.
Mercury Metal Products: *See*—
Jones, W. Richard; Hartman, Albert, Jr.; Conrad, Earl; and Kraig, Harry J., 4,255,928, Cl. 60-324.000.
Meredith, Russell W. Personalized audio-visual system. 4,257,062, Cl. 358-81.000.
Meretsky, Paul L.; and Carmon, Amiram, to Technion Research and Development Foundation, Limited. Transcutaneous pain reliever. 4,256,116, Cl. 128-421.000.
Mergel, Jurgen: *See*—
Divisek, Jiri; and Mergel, Jurgen, 4,256,549, Cl. 204-60.000.
Mergenthaler, Robert: *See*—
Leiber, Heinz; and Mergenthaler, Robert, 4,255,931, Cl. 60-547.00A.
Merzhanov, Alexandr G.: *See*—
Bljumberg, Erna A.; Maslov, Sergei A.; Emanuel, Nikolai M.; Merzhanov, Alexandr G.; and Borovinskaya, Inna P., 4,256,650, Cl. 260-348.330.
Mesa-Tejada, Ricardo: *See*—
Ali, Majid; Nalebuft, Donald; Fayemi, Alfred; Ramanarayanan, Madhava P.; and Mesa-Tejada, Ricardo, 4,256,833, Cl. 435-7.000.
Mesic, Robert S. Pesticide duster. 4,256,241, Cl. 222-85.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Malburg, Werner; and Mohr, Friedbert, 4,257,012, Cl. 331-94.50D.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Tybus, Gerd; and Laube, Hilmar, 4,256,412, Cl. 403-267.000.
Messrs. Leonhard Kurz: *See*—
Meisel, Fritz, 4,256,794, Cl. 428-195.000.
Metal Sales Company (Proprietary) Limited: *See*—
Scherzinger, Rudolf, 4,256,521, Cl. 149-6.000.
Metcalfe, Robert J.: *See*—
Boyer, Adrian J.; Richardson, William R.; Metcalfe, Robert J.; and Foden, Peter J., 4,255,823, Cl. 5-81.00R.
Metz Apparatewerk Inh. Paul Metz: *See*—
Dietrich, Rolf; Hafner, Heinz; and Pecher, Wolfgang, 4,256,393, Cl. 354-145.000.
Meyer, Klaus: *See*—
Cioc, Alexander; Kunzel, Werner; and Meyer, Klaus, 4,256,231, Cl. 215-1.00C.
Meyers, George L., to American Can Company. Multiple compartment pouch and method of making same. 4,256,256, Cl. 229-56.000.
Meyers, Stanley T. Sound reproducing system utilizing motional feedback and integrated magnetic structure. 4,256,923, Cl. 179-1.00F.
Michelet, Daniel; and Rakoutz, Michel, to Philagro. Process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofurane. 4,256,647, Cl. 260-346.220.
Mickleson, Lee, to MCA Discovision, Inc. Write and read objective lens for high density storage. 4,256,374, Cl. 350-472.000.
Midwest Research Institute: *See*—
Goodson, Louis H.; and Jacobs, William B., 4,256,985, Cl. 307-308.000.
Migitaka, Masatoshi: *See*—
Mizukami, Koichiro; and Migitaka, Masatoshi, 4,256,778, Cl. 427-10.000.
Miki, Takao: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.
Mikuni Kogyo Kabushiki Kaisha: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.
Miles, Larry L., to Texas Instruments Incorporated. RMS voltage control with variable duty cycle for matching different liquid crystal display materials. 4,257,045, Cl. 340-784.000.
Miles, Steven W.; and Emerald, Paul R., to Sprague Electric Company. Method for making integrated circuit with C-MOS logic, bipolar driver and polysilicon resistors. 4,256,515, Cl. 148-1.500.
Miller, Barry: *See*—
Kazacos, Maria S.; and Miller, Barry, 4,256,544, Cl. 204-2.100.
Miller, Douglas J.: *See*—
Havens, Marvin R.; Fields, Donald R.; and Miller, Douglas J., 4,256,317, Cl. 277-112.000.
Miller, Franklyn D.: *See*—
Muller, Werner C.; and Miller, Franklyn D., 4,256,541, Cl. 203-19.000.
Miller, Michael E.: *See*—
Allen, James A.; and Miller, Michael E., 4,256,311, Cl. 369-170.000.
Miller, Robert C., to Westinghouse Electric Corp. Electrical energy measuring multimeter. 4,257,004, Cl. 324-141.000.
Milligan, James L. Asphaltic concrete recycling apparatuses, process and system. 4,256,414, Cl. 404-79.000.
Milliken Research Corporation: *See*—
Bolles, Milton M., 4,255,992, Cl. 83-23.000.
Russell, Edwin L.; and Clontz, Norvin A., 4,256,459, Cl. 8-471.000.
Minami, Setsuo: *See*—
Minoura, Kazuo; Tateoka, Masamichi; and Minami, Setsuo, 4,256,364, Cl. 350-6.900.
Miner Enterprises, Inc.: *See*—
Fischer, Robert T., 4,256,042, Cl. 105-282.00P.
Minnesota Mining and Manufacturing Company: *See*—
Anderson, Glenn R., 4,256,986, Cl. 310-155.000.
Hogenson, Raymond A., 4,256,299, Cl. 271-262.000.
McAllister, Jerome W.; Kohler, Gunter A.; and Lund, Virtudes R., 4,256,694, Cl. 422-58.000.
Patterson, Richard A., 4,256,528, Cl. 156-514.000.
Smith, George H., 4,256,828, Cl. 430-280.000.
Wysocki, Steve S.; Nelson, Norman E.; and Vogelgesang, Peter J., 4,257,075, Cl. 360-96.500.
Minolta Camera Kabushiki Kaisha: *See*—
Horimoto, Mitsuaki, 4,256,373, Cl. 350-463.000.
Ikeda, Hiroshi, 4,256,399, Cl. 355-8.000.
Ishida, Tokuji, 4,256,995, Cl. 315-241.00P.
Kawaguchi, Taizo; and Kobayashi, Haruo, 4,256,396, Cl. 354-222.000.
Kitaura, Mashio, 4,256,391, Cl. 354-33.000.
Yasukuni, Mitsuo; Kiten, Hiroshi; Iida, Takashi; Kawamura, Kunio; and Yoshida, Nobuo, 4,256,372, Cl. 350-444.000.
Minoura, Kazuo; Tateoka, Masamichi; and Minami, Setsuo, to Canon Kabushiki Kaisha. Two-dimensional scanning optical system with distortion correction. 4,256,364, Cl. 350-6.900.
Miro: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.
Mishima, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Rhythm generator. 4,256,005, Cl. 84-1.030.
Missout, Gilles: *See*—
Belanger, Guy; and Missout, Gilles, 4,256,152, Cl. 141-70.000.
Misumi, Akira: *See*—
Kawamura, Hiromitsu; Misumi, Akira; and Odawara, Kozo, 4,256,495, Cl. 106-53.000.
Mitchell, Roger R.; Trayler, Robert J.; and Wilson, Eugene M., to Caterpillar Tractor Co. Apparatus for controlling the position of the

pivoting floor and strikeoff blade of an earthmoving scraper. 4,255,885, Cl. 37-126.0AE.
Mitchell S.A.: *See*—
Ruin, Jean, 4,256,271, Cl. 242-84.20G.
Mitsubishi Chemical Industries, Ltd: *See*—
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,256,766, Cl. 424-319.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.
Kii, Masami, 4,256,940, Cl. 200-148.00R.
Mitsubishi Denki KabushikiKaisha: *See*—
Azuma, Kenkoku; and Ikeda, Akira, 4,256,710, Cl. 423-210.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.
Mitsubishi Mining & Cement Co., Ltd.: *See*—
Kubo, Masaaki; Onodera, Yasutaka; Kawaguchi, Hiroshi; and Sibata, Masaharu, 4,256,342, Cl. 299-7.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Yamamoto, Satoshi; Hirae, Toshiyuki; and Koizumi, Yasunori, 4,256,591, Cl. 252-12.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Yamamoto, Ryuichi; and Torri, Masaaki, 4,256,672, Cl. 260-974.000.
Mitsui Toatsu Kagaku Kabushiki Kaisha: *See*—
Kojima, Atsushi; Kohno, Yoshitsugu; Ike, Yoshimasa; Yokoyama, Tatsuro; and Odate, Makoto, 4,256,885, Cl. 544-313.000.
Mitutoyo Manufacturing Company Inc.: *See*—
Nakamura, Tetsuo, 4,255,862, Cl. 33-174.00L.
Miyaguchi, Akinori; Morita, Yasuomi; and Chino, Yasuyoshi, to Nippon Zeon Co. Ltd.; and Morimura-Chemerion Ltd. Oil-modified resins, process for preparation thereof, and a composition for printing ink containing said oil-modified resins as vehicle components. 4,256,619, Cl. 260-23.70C.
Miyaji, Akira: *See*—
Kobayashi, Shunsuke; Miyaji, Akira; and Nara, Yoshio, 4,256,376, Cl. 350-336.000.
Miyao, Hideo: *See*—
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.
Miyashita, Osamu; and Akimoto, Hiroshi, to Takeda Chemical Industries. Dechloromaytansinoids, their pharmaceutical compositions and method of use. 4,256,746, Cl. 424-248.540.
Miyazawa, Masashi: *See*—
Takayanagi, Yoshikazu; Iizumi, Katsuo; Miyazawa, Masashi; Yamaya, Nobuyuki; and Tamura, Hajime, 4,256,917, Cl. 562-562.000.
Mizukami, Koichiro; and Migitaka, Masatoshi, to VLSI Technology Research Association. Method of inspecting and retouching a photo mask. 4,256,778, Cl. 427-10.000.
Moba Holding Barneveld B.V.: *See*—
Van Ginkel, Mannes; and Plug, Jan, 4,255,831, Cl. 17-11.000.
van Ginkel, Mannes; and Plug, Jan, 4,255,832, Cl. 17-11.000.
Mobay Chemical Corporation: *See*—
Barton, Danny B.; Halbleib, Chester W.; and Lonsinger, Jack J., 4,256,661, Cl. 564-18.000.
Mobil Oil Corporation: *See*—
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., 4,256,592, Cl. 252-46.700.
Mockesch, Erich, to Bier-Drive AG. Method of filling a plastic bag in a pressure tank with a carbonated beverage, in particular beer. 4,256,150, Cl. 141-5.000.
Modern Controls, Inc.: *See*—
Mayer, William N., 4,256,533, Cl. 156-633.000.
Modine Manufacturing Company: *See*—
Saperstein, Zalman P., 4,256,177, Cl. 165-151.000.
Mohr, Friedbert: *See*—
Malburg, Werner; and Mohr, Friedbert, 4,257,012, Cl. 331-94.50D.
Mold-Masters Limited: *See*—
Lord, John; and Gellert, Jobst U., 4,256,584, Cl. 210-446.000.
Moles, Donald R.: *See*—
Treharne, Richard W.; McKibben, Charlton K.; Moles, Donald R.; and Bruce, Mitchell R. M., 4,256,967, Cl. 250-544.000.
Molins Limited: *See*—
Labbe, Francis A. M., 4,256,125, Cl. 131-66.00R.
Mollier, Jean: *See*—
Giraud, Georges; and Mollier, Jean, 4,256,955, Cl. 235-380.000.
Monaco, Anthony P. Subcutaneous dialysis system. 4,256,102, Cl. 128-213.00A.
Monette, William A., to Mead Corporation, The. Optical scanner including feedback for reflector control. 4,256,959, Cl. 250-235.000.
Mongeon, Ronald W., to Stellar Systems, Inc. Indicator and alarm for burglar alarms and the like. 4,257,037, Cl. 340-533.000.
Monsanto Company: *See*—
Hare, Jerry B., 4,256,524, Cl. 156-220.000.
Montedison S.p.A.: *See*—
Boschi, Pier M.; Gozzo, Franco; and Longoni, Angelo, 4,256,902, Cl. 548-365.000.
Moody, Howard B., to Owens-Corning Fiberglas Corporation. Class fiber forming. 4,256,477, Cl. 65-2.000.
Mookherjee, Braja D.: *See*—
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,256,776, Cl. 426-535.000.
Mooney Chemicals, Inc.: *See*—
Spector, Richard J., 4,256,847, Cl. 521-117.000.
Moran, John C., to Bell Telephone Laboratories, Incorporated. Multiprocessor system with demand assignable program paging stores. 4,257,097, Cl. 364-200.000.
More, Joseph E. Remote air pressure monitoring and adjusting device for underslung spare tires. 4,256,160, Cl. 152-427.000.
Morean, James E.: *See*—
Fisher, Gary J.; Morean, James E.; Simmons, Perley F.; and VanGorden, Steven N., 4,256,390, Cl. 354-1.000.
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Nagashima, Shigeru; and Nakamura, Kozo, to Japan Crown Cork Co. Ltd. Container closure having easily openable liner comprised of base resin, lubricant and 1 to 15% by weight of a conjugated diene resin. 4,256,234, Cl. 215-343.000.
Mori, Hideo: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,256,890, Cl. 546-158.000.
Mori, Kaoru: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Mori, Shohji: *See*—
Yazaki, Katsuya; Inoue, Takashi; and Mori, Shohji, 4,256,687, Cl. 264-210.100.
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, to Mitsubishi Chemical Industries, Ltd. Immunosuppressant. 4,256,766, Cl. 424-319.000.
Mori, Toshihito: *See*—
Yokoo, Nobuo; and Mori, Toshihito, 4,256,631, Cl. 260-112.00B.
Mori, Yasumichi: *See*—
Kimura, Shigeyuki; Shindo, Isamu; Mori, Yasumichi; Kitamura, Kenji; and Ii, Nobuo, 4,256,531, Cl. 156-620.000.
Morimura-Chemerion Ltd.: *See*—
Miyaguchi, Akinori; Morita, Yasuomi; and Chino, Yasuyoshi, 4,256,619, Cl. 260-23.70C.
Morishita, Teru, to Toyoto Jidosha Kogyo Kabushiki Kaisha. Liquid atomizing device. 4,255,935, Cl. 60-745.000.
Morison, Rodney, to Garrett Corporation, The. Fluid monitor. 4,255,964, Cl. 73-24.000.
Morita, Yasuomi: *See*—
Miyaguchi, Akinori; Morita, Yasuomi; and Chino, Yasuyoshi, 4,256,619, Cl. 260-23.70C.
Morkoc, Hadis: *See*—
Hess, Karl; Streetman, Ben G.; and Morkoc, Hadis, 4,257,055, Cl. 357-16.000.
Morris, Don L.; Gammans, William J.; and Holmes, Jerry D., to Eastman Kodak Company. Oxidation of polyethylene glycols to dicarboxylic acids. 4,256,916, Cl. 562-537.000.
Morris, Harold B.; and Bright, Donald G., to Glasrock Products, Inc. Porous sheets and method of manufacture. 4,256,845, Cl. 521-61.000.
Morris, Roy; and Pickering, Terence J., to USM Corporation. Area measuring machine. 4,256,968, Cl. 250-560.000.
Morrison Machine Company: *See*—
Stanislaw, Peter P., 4,256,537, Cl. 162-273.000.
Morse, John B.: *See*—
Johnson, Bruce K.; and Morse, John B., 4,256,395, Cl. 354-180.000.
Morton, Edward W., to Westinghouse Electric Corp. Energy saving device for rapid-start fluorescent lamp system. 4,256,993, Cl. 315-106.000.
Mose, Luciano; Schurig, Helmut; and Strasser, Bernd, to Hooker Chemicals & Plastics Corp. Unitary filter press cell circuit. 4,256,562, Cl. 204-258.000.
Moser, Erwin: *See*—
Efinger, Arnold; and Moser, Erwin, 4,256,938, Cl. 200-144.00B.
Moser, Paul; Rody, Jean; and Karrer, Friedrich, to Ciba-Geigy Corporation. Novel light stabilizers for plastics. 4,256,627, Cl. 260-45.75N.
Moshofsky, Jerome F., to Smith, Lawrence M. Surgical staplers and staple. 4,256,251, Cl. 227-120.000.
Motorola, Inc.: *See*—
Duel, Don M., 4,256,279, Cl. 248-184.000.
Norris, Dean E.; and Welling, John R., 4,255,938, Cl. 62-268.000.
Ryon, Donald C., 4,256,008, Cl. 84-454.000.
Motosugi, Katsuhiko: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,256,063, Cl. 123-52.00M.
Mott, James D., to Hydril Company. Method of moving a through-the-flowline installed safety valve through a curved flow line. 4,256,180, Cl. 166-315.000.
Mountcastle, Donald B.: *See*—
Biltonen, Rodney L.; Mountcastle, Donald B.; and Suurkuust, Jaak, 4,255,961, Cl. 73-15.00B.
Mourier, Jacqueline: *See*—
Guigues, Francois; Mourier, Jacqueline; and Demozay, Daniel, 4,256,480, Cl. 71-88.000.
Mowery, Frank D.: *See*—
Kochanski, Aloysius J.; Mowery, Frank D.; and Hire, Charles J., 4,256,973, Cl. 307-118.000.
Muacevic, Gojko: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,256,753, Cl. 424-273.00R.
Mueller, Robert S., to Eaton Corporation. Valve disabler with improved actuator. 4,256,070, Cl. 123-198.00F.

Muenchinger, Herman G., to Research Engineering & Manufacturing, Inc. Dies for making thread-forming screw with step taper. 4,255,959, Cl. 72-469.000.

Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, to Bayer Aktiengesellschaft. Synergistic arthropodicidal compositions containing α-substituted-3,4-methylenedioxyphenylacetonitriles. 4,256,740, Cl. 424-200.000.

Muetterties, Andrew J.; and Genese, Joseph N., to Abbott Laboratories. Equipment sets and system for the sequential administration of medical liquids at dual flow rates. 4,256,104, Cl. 128-214.00G.

Muetterties, Andrew J.: *See—*
Leahey, John J.; Muetterties, Andrew J.; and Genese, Joseph N., 4,256,105, Cl. 128-214.00G.

Mukoyama, Makoto, to Toyota Jidosha Kogya Kabushiki Kaisha. Device for absorbing impact energy. 4,255,986, Cl. 74-492.000.

Muller, Hermann: *See—*
Fandrey, Peter; and Muller, Hermann, 4,256,436, Cl. 415-143.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. Process for the preparation of oxadiazolopyrimidine derivatives. 4,256,886, Cl. 544-323.000.

Muller, Werner C.; and Miller, Franklyn D., to National Distillers and Chemical Corp. Production of anydrous alcohol. 4,256,541, Cl. 203-19.000.

Muller, Wolfgang: *See—*
Kroger, Hans; Muller, Wolfgang; and Denzinger, Wolfgang, 4,257,090, Cl. 363-65.000.

Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, to Eisai Co., Ltd. Novel hydroxamic acid compounds, method for preparation thereof and medicaments containing such compounds. 4,256,765, Cl. 424-315.000.

Munson, Mark R. Marble shooter device. 4,256,077, Cl. 124-26.000.

Murabayashi, Akira: *See—*
Makisumi, Yasuo; Murabayashi, Akira; Takase, Akira; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,256,899, Cl. 548-246.000.

Murai, Tetsunosuke, to Nihon Number Plate Kabushiki Kaisha. Illuminant display device and motor license plate using same. 4,255,887, Cl. 40-206.000.

Murakami, Kimio: *See—*
Yamamoto, Masaji; Shioi, Keiko; and Murakami, Kimio, 4,256,494, Cl. 106-22.000.

Murakami, Nanami: *See—*
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,256,890, Cl. 546-158.000.

Muramatsu, Toshio: *See—*
Tarumi, Noriyoshi; Tamura, Akihiko; Kokiso, Masakazu; Muramatsu, Toshio; and Nagayasu, Koichi, 4,256,822, Cl. 430-62.000.

Murata, Bunjiro: *See—*
Ito, Katsuo; Murata, Bunjiro; Yoshimura, Kazunori; and Yamaguchi, Kenichi, 4,256,935, Cl. 200-51.00R.

Murata Manufacturing Co., Ltd.: *See—*
Ito, Katsuo; Murata, Bunjiro; Yoshimura, Kazunori; and Yamaguchi, Kenichi, 4,256,935, Cl. 200-51.00R.

Murayama, Noboru; and Taniguchi, Hayashi, to Ricoh Company, Ltd. Data compression apparatus. 4,257,069, Cl. 358-261.000.

Muriotto, Angelo. Process for producing prefabricated panels and tridimensional elements for building and products obtained from said process. 4,255,915, Cl. 52-601.000.

Murray, Pat L.: *See—*
Koehler, Charles E.; McClellan, Thomas R.; and Murray, Pat L., 4,256,802, Cl. 428-310.000.

Murray, Peter E.: *See—*
Obst, Rudiger; Wilmes, Manfred; and Murray, Peter E., 4,255,838, Cl. 24-255.0BS.

Musser, Harry R.: *See—*
Davis, Burns; Barbee, Robert B.; and Musser, Harry R., 4,256,860, Cl. 525-437.000.

Mussinan, Cynthia J.: *See—*
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,256,776, Cl. 426-535.000.

Mylrea, Kenneth C., to Paxinos, James, a part interest. Automatic sequential fluid flow apparatus. 4,256,103, Cl. 128-214.00R.

Nadir, James, to Intel Corporation. System bus arbitration, circuitry and methodology. 4,257,095, Cl. 364-200.000.

Nagai, Yasutaka: *See—*
Uno, Hitoshi; Nagai, Yasutaka; Hino, Katsuhiko; and Nakamura, Hideo, 4,256,753, Cl. 424-263.000.

Nagashima, Shigeru: *See—*
Hatanaka, Masayuki; and Nagashima, Shigeru, 4,256,616, Cl. 260-18.00S.
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Nagashima, Shigeru; and Nakamura, Kozo, 4,256,234, Cl. 215-343.000.

Nagayasu, Koichi: *See—*
Tarumi, Noriyoshi; Tamura, Akihiko; Kokiso, Masakazu; Muramatsu, Toshio; and Nagayasu, Koichi, 4,256,822, Cl. 430-62.000.

Nagel, Joachim, to Biotronik Mess-und Therapiegerate GmbH & Co. Apparatus for the detection and recording of uterine activity. 4,256,118, Cl. 128-733.000.

Nagel, Rudolf: *See—*
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.

Naitou, Takao; and Tsuzuki, Toshio, to Matsushita Electric Industrial Co., Ltd. Escapement assembly for fastening feeding apparatus. 4,256,238, Cl. 221-263.000.

Najer, Leonard M.; and Urban, John A., to Eaton Corporation. Slack adjuster. 4,256,208, Cl. 188-196.00D.

Nakabayashi, Masahiro: *See—*
Baumann, Stephen F.; Nakabayashi, Masahiro; Uttrachi, Gerald D.; Coless, Thomas L.; and Levine, Ernest N., 4,256,949, Cl. 219-146.240.

Nakagami, Tatsuro: *See—*
Fukui, Toyoaki; Nakagami, Tatsuro; Endo, Norio; Miki, Takao; and Ishida, Takashi, 4,256,075, Cl. 123-478.000.

Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, to OtsukaPharmaceutical Co., Ltd. 3,4-Dihydrocarbostyril derivatives and process for producing the same. 4,256,890, Cl. 546-158.000.

Nakamura, Hideo: *See—*
Uno, Hitoshi; Nagai, Yasutaka; Hino, Katsuhiko; and Nakamura, Hideo, 4,256,753, Cl. 424-263.000.

Nakamura, Hitoshi: *See—*
Fujimura, Itaru; Nakamura, Hitoshi; Kuroishi, Shoji; Seko, Nachio; and Ogawa, Toshiyuki, 4,256,401, Cl. 355-14.00E.

Nakamura, Kenichi: *See—*
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, 4,256,047, Cl. 112-158.00E.

Nakamura, Kotaro: *See—*
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, 4,256,817, Cl. 430-17.000.

Nakamura, Kozo: *See—*
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Nagashima, Shigeru; and Nakamura, Kozo, 4,256,234, Cl. 215-343.000.

Nakamura, Michiharu; Yamashita, Shigeo; Kuroda, Takao; and Umeda, Jun-ichi, to Hitachi, Ltd. Semiconductor laser device. 4,257,011, Cl. 331-94.50H.

Nakamura, Michio: *See—*
Shimoma, Taketoshi; Fukuda, Kumio; and Nakamura, Michio, 4,257,024, Cl. 335-213.000.

Nakamura, Susao: *See—*
Haraguchi, Keisuke; and Nakamura, Susao, 4,256,394, Cl. 354-173.000.

Nakamura, Tetsuo, to Mitutoyo Manufacturing Company Inc. Configured contour measuring apparatus. 4,255,862, Cl. 33-174.00L.

Nakata, Kiyohiro; and Suwa, Hiroaki, to Kabushiki Kaisha Mitutoyo Seisakusho. Electrically digital display micrometer. 4,255,861, Cl. 33-166.000.

Nakatani, Motohiko: *See—*
Kitayama, Shoji; Okamitsu, Hiroaki; Nakatani, Motohiko; and Shibata, Toshiroh, 4,256,428, Cl. 414-121.000.

Nakatani, Nobuo: *See—*
Sobata, Tamotsu; and Nakatani, Nobuo, 4,256,601, Cl. 252-135.000.

Nakatomi, Takayoshi; and Aoki, Keiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Spark timing control method and device. 4,256,072, Cl. 123-415.000.

Nakayama, Hiroyuki: *See—*
Tazuke, Shigeo; Kimura, Hitoshi; and Nakayama, Hiroyuki, 4,256,782, Cl. 427-53.100.

Nakayama, Motohiro: *See—*
Yoshida, Katsuyoshi; Higashi, Mitsuo; Kanamaru, Tatsuya; and Nakayama, Motohiro, 4,256,519, Cl. 148-156.000.

Nakayama, Yoshinori: *See—*
Asao, Shuichiro; Nakayama, Yoshinori; Yoshida, Ryo; Sumida, Seizo; and Hashimoto, Shunichi, 4,256,483, Cl. 71-92.000.

Nalebuft, Donald: *See—*
Ali, Majid; Nalebuft, Donald; Fayemi, Alfred; Ramanarayanan, Madhava P.; and Mesa-Tejada, Ricardo, 4,256,833, Cl. 435-7.000.

Nara, Yoshio: *See—*
Kobayashi, Shunsuke; Miyaji, Akira; and Nara, Yoshio, 4,256,376, Cl. 350-336.000.

Narozny, Ronald S.; and Wilson, Albert H., to Thomas & Betts Corporation. Remote socket for DIP components. 4,257,028, Cl. 339-126.00R.

Naruse, Tunehide; and Matsumoto, Ikuo, to Victor Company of Japan, Ltd. Binder composition for magnetic recording tape. 4,256,852, Cl. 525-6.000.

Naslund, Lars A.; and Laskin, Allen I., to Exxon Research & Engineering Co. Modified heteropolysaccharides and their preparation. 4,256,590, Cl. 252-8.55D.

Natalie, Adam J. Power device. 4,255,930, Cl. 60-546.000.

National Blank Book Company, Inc.: *See—*
Podosek, Edward, 4,256,411, Cl. 402-73.000.

National Can Corporation: *See—*
Sauer, Donald G., 4,256,449, Cl. 425-388.000.

National Distillers and Chemical Corp.: *See—*
Muller, Werner C.; and Miller, Franklyn D., 4,256,541, Cl. 203-19.000.

National Institute for Researches in Inorganic Materials: *See—*
Kimura, Shigeyuki; Shindo, Isamu; Mori, Yasumichi; Kitamura, Kenji; and Ii, Nobuo, 4,256,531, Cl. 156-620.000.

National Research Development Corporation: *See—*
Barnard, Bryon G., 4,256,050, Cl. 116-63.00C.

National Semiconductor Corporation: *See—*
Shum, Ying K., 4,257,056, Cl. 357-23.000.

Natmar, Inc.: *See—*
Clay, Bobby J., 4,255,997, Cl. 83-175.000.

Natori, Minoru: *See—*
Hatuse, Toshikazu; Natori, Minoru; Shimazaki, Toshikazu; Kawanobe, Kouhei; and Ogawa, Hiroshi, 4,257,115, Cl. 368-69.000.

Naumann, Klaus; Schubart, Rudiger; and Schmidt, Thomas, to Bayer Aktiengesellschaft. Preparation of substituted vinylcyclopropanecarboxylic acid esters. 4,256,907, Cl. 560-124.000.
Naylor, Floyd E.; and Wright, Roy F., to Phillips Petroleum Company. Nonlaminating polyphenylene ether blends. 4,256,853, Cl. 525-92.000.
Needle Industries Limited: *See*—
Sanders, Norman T., 4,255,948, Cl. 66-123.000.
Neighbors, James. Scaffolding frame members. 4,256,201, Cl. 182-82.000.
Nelson, Norman E.: *See*—
Wysocki, Steve S.; Nelson, Norman E.; and Vogelgesang, Peter J., 4,257,075, Cl. 360-96.500.
NEP Sales, Inc.: *See*—
Kiser, Cecil M., Jr., 4,256,197, Cl. 180-335.000.
NESPAK S.p.A. Societa Generale per l'Imballaggio: *See*—
Sabba, Pierluigi, 4,256,690, Cl. 264-504.000.
Nestor, John J.; and Vickery, Brian H., to Syntex (U.S.A.) Inc. Long acting depot injectable formulations for LH-RH analogues. 4,256,737, Cl. 424-177.000.
Netherton, Lowell E.: *See*—
Patil, Arvind S.; and Netherton, Lowell E., 4,256,508, Cl. 156-304.000.
Nething, Dell W. Hammer plow. 4,256,182, Cl. 172-45.000.
Neufeldt, Jacob J. Refuse compacting device. 4,256,035, Cl. 100-145.000.
Neuner, Ludwig; and Laimer, Friedrich, to Voest-Alpine Aktiengesellschaft. Converter arrangement. 4,256,289, Cl. 266-159.000.
New J Industries Ltd.: *See*—
Janzen, Samuel P., 4,255,920, Cl. 56-126.000.
Newhouse, Vernon L.; and LeCong, Phung, to Purdue Research Foundation. Double repetition rate doppler flow measurement system. 4,255,977, Cl. 73-861.250.
Nibby, Chester M., Jr.: *See*—
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,255,852, Cl. 29-837.000.
Nichols, Richard D. E.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,256,243, Cl. 224-244.000.
Nichols, Robert L. Shut off valve for medical suction apparatus. 4,256,109, Cl. 128-276.000.
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., to Research Corporation. Pyridoza prostacyclin analogues and N-oxides thereof. 4,256,883, Cl. 544-235.000.
Nicolas, Gerard: *See*—
Campillo, Louis; and Nicolas, Gerard, 4,255,853, Cl. 29-843.000.
Niedecker, Herbert. Wrapper closed with a U-shaped clip and process and apparatus for attaching a hanger loop to the wrapper section. 4,255,833, Cl. 17-44.400.
Nielsen, Anker J., Jr. Positive locking terminal bushings for flexible tubing. 4,256,335, Cl. 285-250.000.
Nienhaus, Harry A.: *See*—
Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., 4,257,007, Cl. 328-167.000.
Nihon Medi+Physics Co., Ltd.: *See*—
Kato, Makoto; and Hazue, Masaaki, 4,256,726, Cl. 424-1.000.
Nihon Number Plate Kabushiki Kaisha: *See*—
Murai, Tetsunosuke, 4,255,887, Cl. 40-206.000.
Niinobe, Takao; Yoshida, Kokichi; and Yokoyama, Masao. Method for producing vitamin B_1 and its intermediate. 4,256,550, Cl. 204-72.000.
Nilssen, Ole K. High-efficiency single-ended inverter circuit. 4,257,088, Cl. 363-18.000.
Nilsson, Jan: *See*—
Adlerborn, Jan; Larker, Hans; and Nilsson, Jan, 4,256,688, Cl. 264-325.000.
Ninomiya, Saburo: *See*—
Tamura, Kazuhiro; and Ninomiya, Saburo, 4,256,812, Cl. 429-56.000.
Nippon Electric Co., Ltd.: *See*—
Sakoe, Hiroaki, 4,256,924, Cl. 179-1.0SD.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Takeuchi, Chifumi, 4,256,004, Cl. 84-1.210.
Nippon Kogaku K.K.: *See*—
Kobayashi, Shunsuke; Miyaji, Akira; and Nara, Yoshio, 4,256,376, Cl. 350-336.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Ouchi, Chiaki; and Kohsaka, Yohji, 4,256,516, Cl. 148-12.00R.
Nippon Oil Co., Ltd.: *See*—
Takezono, Tetsuya; and Fujiwara, Yasuo, 4,256,465, Cl. 44-56.000.
Nippon Paint Co., Ltd.: *See*—
Sobata, Tamotsu; and Nakatani, Nobuo, 4,256,601, Cl. 252-135.000.
Nippon Petrochemicals Co., Ltd.: *See*—
Yazaki, Katsuya; Inoue, Takashi; and Mori, Shohji, 4,256,687, Cl. 264-210.100.
Nippon Sheet Glass Co., Ltd.: *See*—
Matsumoto, Jun; Tanigaki, Akira; Ohsato, Nobuyoshi; Tokuda, Nobuhiko; and Tanaka, Keihachiro, 4,256,478, Cl. 65-5.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,256,604, Cl. 252-188.30R.
Nippon Skokubei Kagaku Kogyo Co., Ltd.: *See*—
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, 4,256,783, Cl. 422-197.000.
Nippon Soda Company, Ltd.: *See*—
Shimokai, Katzujiro; Kataoka, Masayuki; and Funamoto, Akihiko, 4,256,621, Cl. 260-29.7NR.
Nippon Steel Corporation: *See*—
Yoshida, Katsuyoshi; Higashi, Mitsuo; Kanamaru, Tatsuya; and Nakayama, Motohiro, 4,256,519, Cl. 148-156.000.
Nippon Zeon Co. Ltd.: *See*—
Miyaguchi, Akinori; Morita, Yasuomi; and Chino, Yasuyoshi, 4,256,619, Cl. 260-23.70C.
Nippondenso Co., Ltd.: *See*—
Shirasaki, Shinji; Ohta, Katsuhiro; and Sugisaki, Takao, 4,257,040, Cl. 340-671.000.
Nishihara, Toshio: *See*—
Inata, Hiroo; Arakawa, Tamio; and Nishihara, Toshio, 4,256,558, Cl. 204-159.150.
Nishihira, Keigo: *See*—
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, 4,256,908, Cl. 560-204.000.
Nishijima, Hideo: *See*—
Fukushima, Isao; Kimura, Hiroyuki; and Nishijima, Hideo, 4,256,975, Cl. 307-543.000.
Nishikawa, Masaji, to Olympus Optical Co. Ltd. Method and apparatus of detecting toner concentration of dry developer. 4,256,402, Cl. 356-38.000.
Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing glucona-delta-lactone from glucose. 4,256,645, Cl. 260-343.500.
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, to Ube Industries, Ltd. Process for preparing diesters of malonic acid. 4,256,908, Cl. 560-204.000.
Nishimura, Shigeaki: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Nishino, Hiroshi; Aibe, Toshio; and Ogino, Fumiichi, to Takeda Chemical Industries, Ltd. Deodorization method. 4,256,728, Cl. 422-4.000.
Nishiwaki, Takeshi, to Akebono Brake Industry Company, Ltd. Friction pressure welding method. 4,256,253, Cl. 228-112.000.
Nissan Motor Company, Limited: *See*—
Kawakami, Yasushi; and Iwasaki, Hiroshi, 4,256,198, Cl. 181-141.000.
Sugasawa, Fukashi; and Etoh, Yukihiro, 4,256,074, Cl. 123-440.000.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,255,983, Cl. 74-752.00C.
Yanai, Tokiyoshi, 4,255,980, Cl. 74-388.0PS.
Nitrokemia Ipartelepek: *See*—
Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, 4,256,481, Cl. 71-88.000.
NL Industries, Inc.: *See*—
Kroplinski, Thaddeus F.; and Case, Barton C., 4,256,617, Cl. 260-18.0TN.
Noack, Rolf; and Gramelt, Stefan, to Deutsche Babcock Aktiengesellschaft. Arrangement for the thermal regeneration of charged active coke or active carbon granulate. 4,256,606, Cl. 252-411.00R.
Nogi, Teiji; and Yasuda, Takao, to Kabushiki Kaisha Meidensha. Disconnecting switch arrangement. 4,256,934, Cl. 200-48.00R.
Noguchi, Yasuhiro; Sakaguchi, Shinji; and Yoshida, Takashi, to Fuji Photo Film Co., Ltd. Photographic element for color diffusion transfer process having a novel neutralizing system. 4,256,827, Cl. 430-215.000.
Noji, Masahide: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,256,652, Cl. 260-429.00R.
Nonaka, Yuji: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Nord, Paul J.: *See*—
Frank, Clyde W.; Nord, Paul J.; and Cox, Robert D., 4,256,462, Cl. 23-230.00R.
Nordqvist, Karl-Gustav E.: *See*—
Bergman, Sven A.; Ohlsson, Per J.; and Nordqvist, Karl-Gustav E., 4,257,010, Cl. 331-65.000.
Nordson Corporation: *See*—
McDaniel, David C., 4,256,526, Cl. 156-295.000.
Norlin Industries, Inc.: *See*—
Auer, Siegfried O., 4,257,106, Cl. 364-525.000.
Norris, Dean E.; and Welling, John R., to Motorola Inc. Water boiler/-venturi cooler. 4,255,938, Cl. 62-268.000.
Norris Industries, Inc.: *See*—
Dietrich, Hagen; and Fane, William J., 4,255,953, Cl. 70-107.000.
Northern Telecom Limited: *See*—
Ayres, Rand K.; and Sherif, Hassan A., 4,256,920, Cl. 174-65.00R.
Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., 4,256,807, Cl. 428-379.000.
Northwest Ecological Research & Development, Inc.: *See*—
Richardson, Frederick J., 4,256,485, Cl. 75-6.000.
Notifier Company: *See*—
Rounds, Michael F.; and Ranney, Richard D., 4,257,038, Cl. 340-539.000.
Novello, Frederick C.; and Baldwin, John J., to Merck & Co., Inc. 1,2,4-Triazoles and a method for their preparation. 4,256,887, Cl. 544-333.000.
Nozawa, Kenji, to Matsushita Reiki Co., Ltd. Refrigerating machine oil. 4,256,593, Cl. 252-49.800.
Nuclear Power Company Limited: *See*—
Scott, Donald, 4,256,538, Cl. 176-40.000.

Obst, Rudiger; Wilmes, Manfred; and Murray, Peter E., to C. A. Weidmuller K.G. Support for electrical busbars. 4,255,838, Cl. 24-255.0BS.
Occidental Research Corporation: *See—*
DiGiacomo, Peter M.; and Dines, Martin B., 4,256,872, Cl. 528-395.000.
Sikdar, Subhas K., 4,256,716, Cl. 423-321.00S.
Ochlich, Peter P.: *See—*
Goring, Joachim E.; and Ochlich, Peter P., 4,256,750, Cl. 424-253.000.
Odate, Makoto: *See—*
Kojima, Atsushi; Kohno, Yoshitsugu; Ike, Yoshimasa; Yokoyama, Tatsuro; and Odate, Makoto, 4,256,885, Cl. 544-313.000.
Odawara, Kozo: *See—*
Kawamura, Hiromitsu; Misumi, Akira; and Odawara, Kozo, 4,256,495, Cl. 106-53.000.
Oertel, Gunter: *See—*
Ick, Jurgen; Meiners, Hans J.; Oertel, Gunter; Hauptmann, Gunter; and Konig, Klaus, 4,256,849, Cl. 521-129.000.
Ogata, Yuzuru: *See—*
Kinoshita, Tsukuru; Ogata, Yuzuru; and Suzue, Masayoshi, 4,256,715, Cl. 423-300.000.
Ogawa, Hiroshi: *See—*
Hatuse, Toshikazu; Natori, Minoru; Shimazaki, Toshikazu; Kawanobe, Kouhei; and Ogawa, Hiroshi, 4,257,115, Cl. 368-69.000.
Ogawa, Toshihisa: *See—*
Kobashi, Mamoru; and Ogawa, Toshihisa, 4,256,073, Cl. 123-422.000.
Ogawa, Toshiyuki: *See—*
Fujimura, Itaru; Nakamura, Hitoshi; Kuroishi, Shoji; Seko, Nachio; and Ogawa, Toshiyuki, 4,256,401, Cl. 355-14.00E.
Ogino, Fumiichi: *See—*
Itoga, Kiyoshi; Ogino, Fumiichi; Shirakawa, Kinichi; and Soga, Yasuyuki, 4,256,773, Cl. 426-415.000.
Nishino, Hiroshi; Aibe, Toshio; and Ogino, Fumiichi, 4,256,728, Cl. 422-4.000.
Ohara, Naoki: *See—*
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, 4,256,047, Cl. 112-158.00E.
Ohashi, Nobuo: *See—*
Yoshioka, Keiichi; Kinoshita, Noboru; Ono, Yutaka; and Ohashi, Nobuo, 4,256,486, Cl. 75-125.000.
Ohashi, Takashi; Okuyama, Toru; and Suzuki, Akira, to Bridgestone Tire Co., Ltd. Fireproof laminates. 4,256,799, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Kaneda, Hiroshi; Taniguchi, Yoshiko; and Yoshida, Masako, to Bridgestone Tire Co., Ltd. Method of producing flameproof polyisocyanurate foams. 4,256,846, Cl. 521-117.000.
Ohdan, Kyoji: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, 4,256,914, Cl. 562-535.000.
Ohlsson, Per J.: *See—*
Bergman, Sven A.; Ohlsson, Per J.; and Nordqvist, Karl-Gustav E., 4,257,010, Cl. 331-65.000.
Ohmori, Muneki: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Ohsato, Nobuyoshi: *See—*
Matsumoto, Jun; Tanigaki, Akira; Ohsato, Nobuyoshi; Tokuda, Nobuhiko; and Tanaka, Keihachiro, 4,256,478, Cl. 65-5.000.
Ohta, Kaname: *See—*
Asada, Akihiro; Tanaka, Hiromichi; and Ohta, Kaname, 4,256,980, Cl. 307-254.000.
Ohta, Katsuhiro: *See—*
Shirasaki, Shinji; Ohta, Katsuhiro; and Sugisaki, Takao, 4,257,040, Cl. 340-671.000.
Ohtani, Masami, to Dainippon Screen Seizo Kabushiki Kaisha. Double surfaced developing tank. 4,256,398, Cl. 354-320.000.
Ohtsuka, Kunio: *See—*
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,255,983, Cl. 74-752.00C.
Oien, Michael A.: *See—*
Ammann, Hans H.; and Oien, Michael A., 4,256,512, Cl. 134-64.00R.
Okamitsu, Hiroaki: *See—*
Kitayama, Shoji; Okamitsu, Hiroaki; Nakatani, Motohiko; and Shibata, Toshiroh, 4,256,428, Cl. 414-121.000.
Okamoto, Giro: *See—*
Ito, Masayuki; Okamoto, Giro; Machi, Sueo; and Shirayama, Kenzo, 4,256,856, Cl. 525-331.000.
Okamura, Noriaki: *See—*
Yokoyama, Sigeaki; Toyoda, Tsunehiko; and Okamura, Noriaki, 4,256,493, Cl. 106-22.000.
Okuyama, Toru: *See—*
Ohashi, Takashi; Okuyama, Toru; and Suzuki, Akira, 4,256,799, Cl. 428-215.000.
Ohashi, Takashi; Okuyama, Toru; Kaneda, Hiroshi; Taniguchi, Yoshiko; and Yoshida, Masako, 4,256,846, Cl. 521-117.000.
Olevsky, Viktor M.: *See—*
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.
Oline, James A.: *See—*
Meitzner, Erich F.; and Oline, James A., 4,256,840, Cl. 521-33.000.
Olschewski, Armin: *See—*
Kunkel, Heinrich; Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,256,193, Cl. 175-371.000.
Olsson, Burton K.: *See—*
Larson, Ellis; and Olsson, Burton K., 4,256,315, Cl. 277-92.000.
Olsson, Lars-Henrik: *See—*
Karlsson, Alf H.; Lundstrom, Hans E.; and Olsson, Lars-Henrik, 4,256,877, Cl. 536-59.000.
Olympus Optical Co. Ltd.: *See—*
Fukuoka, Kenji, 4,257,044, Cl. 340-731.000.
Nishikawa, Masaji, 4,256,402, Cl. 356-38.000.
Onimaru, Masayuki: *See—*
Kawaguchi, Takeshi; Kobayashi, Yasuhisa; and Onimaru, Masayuki, 4,256,346, Cl. 301-64.0SH.
Ono, Noboru: *See—*
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,256,384, Cl. 351-7.000.
Ono Pharmaceutical Co., Ltd.: *See—*
Hayashi, Masaki; Tanouchi, Tadao; Kawamura, Masanori; and Kajiwara, Ikuo, 4,256,757, Cl. 424-273.00R.
Ono, Takezo; Watanabe, Mineo; and Iribe, Seiki, to Teijin Engineering Ltd. Method and apparatus for regenerating spent photographic bleach-fixer solution. 4,256,559, Cl. 204-180.00P.
Ono, Yutaka: *See—*
Yoshioka, Keiichi; Kinoshita, Noboru; Ono, Yutaka; and Ohashi, Nobuo, 4,256,486, Cl. 75-125.000.
Onodera, Yasutaka: *See—*
Kubo, Masaaki; Onodera, Yasutaka; Kawaguchi, Hiroshi; and Sibata, Masaharu, 4,256,342, Cl. 299-7.000.
Ontario Research Foundation: *See—*
Brandstatter, Hans G., 4,256,496, Cl. 106-43.000.
Organon Teknika Corporation: *See—*
McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., 4,256,718, Cl. 423-419.00P.
Oros Company: *See—*
Gardner, James H.; and de Nevers, Noel H., 4,255,944, Cl. 62-457.000.
Orszullok, Willy, to Friedrich Grohe Armaturenfabrik GmbH & Co. Valve cartridge. 4,256,163, Cl. 137-625.310.
Orth, Winfried: *See—*
Maurer, Manfred; Orth, Winfried; and Fickert, Werner, 4,256,892, Cl. 546-261.000.
Ortho Pharmaceutical Corporation: *See—*
Wachter, Michael P., 4,256,644, Cl. 260-340.90R.
Osagawa, Atsumi: *See—*
Futaba, Kunihiko; Shimazaki, Toshikazu; Osagawa, Atsumi; and Hiraoka, Akira, 4,257,118, Cl. 368-276.000.
Osinski, Ulrich; and Kummer, Rene, to Maschinenfabrik Hennecke GmbH. Process and device for filling cavities, particularly mold cavities, with a reactive, flowable mixture. 4,256,679, Cl. 264-51.000.
Ostehsson, Lars B.: *See—*
Roy, Ram B.; Ostehsson, Lars B.; and Westin, Rolf B., 4,256,808, Cl. 428-421.000.
Ota, Akiho: *See—*
Suzuki, Sadao; Akutsu, Masao; and Ota, Akiho, 4,256,789, Cl. 428-35.000.
Ota, Chuichi; Seki, Norio; and Sakaguchi, Haruo, to Kokusai Denshin Denwa Kabushiki Kaisha. Fault locating system in optical fiber transmission system. 4,257,033, Cl. 340-870.160.
Ota, Seisaku: *See—*
Masuda, Yutaka; and Ota, Seisaku, 4,256,069, Cl. 123-196.00S.
Otala, Matti N. T., to Otamation Oy. Electronic igniter for fluorescent lamps. 4,256,991, Cl. 315-104.000.
Otamation Oy: *See—*
Otala, Matti N. T., 4,256,991, Cl. 315-104.000.
Otis Elevator Company: *See—*
Masel, Marvin, 4,256,203, Cl. 187-29.00R.
Otsuka Chemical Co., Ltd.: *See—*
Kinoshita, Tsukuru; Ogata, Yuzuru; and Suzue, Masayoshi, 4,256,715, Cl. 423-300.000.
Otsuka, Norimoto; and Godo, Osanori, to Honda Giken Kogyo Kabushiki Kaisha. Combined carrying and locking device for a cycle. 4,256,322, Cl. 280-289.00L.
OtsukaPharmaceutical Co., Ltd.: *See—*
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,256,890, Cl. 546-158.000.
Ott, Louis E., to Standard Oil Company (Indiana). Aqueous sulfur dispersion having reduced corrosive activity toward ferrous metal. 4,256,691, Cl. 422-7.000.
Otto, Jack C.: *See—*
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,256,553, Cl. 204-106.000.
Ou, Sam A., to Emerson Electric Co. Four way reversing valve. 4,255,939, Cl. 62-324.00A.
Ouchi, Chiaki; and Kohsaka, Yohji, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing non-magnetic Fe-Mn steels having low thermal expansion coefficients and high yield points. 4,256,516, Cl. 148-12.00R.
Ovitz, Ernest G., III, to John H. Best & Sons, Inc. Display system for sample articles. 4,256,043, Cl. 108-29.000.
Owen, Donald W. Rotary switch. 4,256,932, Cl. 200-11.0TC.
Owen Lumber & Millwork, Inc.: *See—*
Birmingham, Robert A., 4,256,287, Cl. 256-59.000.
Owens-Corning Fiberglas Corporation: *See—*
Moody, Howard B., 4,256,477, Cl. 65-2.000.

Owens-Illinois, Inc.: *See*—
Amberg, Stephen W., 4,256,028, Cl. 493-287.000.
Taylor, Lynn J.; and Tobias, John W., 4,256,851, Cl. 525-1.000.

Oyama, Kiyotaka: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.

Ozaki, Masayoshi: *See*—
Tsujimoto, Susumu; Yamazaki, Hayao; Ozaki, Masayoshi; and Kobayashi, Takehiro, 4,256,127, Cl. 132-9.000.

Ozawa, Kazunori: *See*—
Shimizu, Yukihiko; and Ozawa, Kazunori, 4,257,076, Cl. 360-130.240.

Pacific Roller Die Co., Inc.: *See*—
Davis, Paul K., 4,255,999, Cl. 83-367.000.

Pack Image, Inc.: *See*—
Stone, Orison W., 4,256,226, Cl. 206-427.000.

Package Machinery Company: *See*—
Farrell, Robert E., 4,256,447, Cl. 425-159.000.

Padgett, Clarence W.; and Marmet, Melvin L., to Rockwell International Corporation. Metal oxide semiconductor (MOS) input circuit with hysteresis. 4,256,974, Cl. 307-475.000.

Pako Corporation: *See*—
Strunc, Gerald R., 4,255,994, Cl. 83-79.000.

Palazzo, Salvator F. Reefer sweeper. 4,255,827, Cl. 15-160.000.

Palazzolo, Salvatore E.: *See*—
Cannady, Daniel L., Jr.; and Palazzolo, Salvatore E., 4,256,793, Cl. 428-137.000.

Palecki, Gerald S.: *See*—
Kopf, J. David; Seiler, William, Jr.; Palecki, Gerald S.; and Kaufman, Howard H., 4,256,112, Cl. 128-303.00B.

Palisek, William F., to Interstate Industries, Inc. Multiple dome switch assembly having pivotable common actuator. 4,256,931, Cl. 200-5.00A.

Pantelides, Antis N.: *See*—
Ford, Geoffrey E.; and Pantelides, Antis N., 4,256,957, Cl. 250-223.00B.

Papalos, John G.; and Kavchok, Ronald W., to Diamond Shamrock Corporation. Synthetic polymer emulsifier from condensation of naphthalene sulfonic acid, alkyl benzene sulfonic acid and formaldehyde. 4,256,871, Cl. 528-265.000.

Papay, Joseph M., to Pay Television Corporation. Video clamp and inverter circuit. 4,257,065, Cl. 358-172.000.

Papp, Richard B.: *See*—
Wolsky, Alfred A.; Papp, Richard B.; and Victor, James G., 4,256,912, Cl. 560-248.000.

Paramount Sound Systems Corporation: *See*—
Engebretson, Mark E., 4,256,389, Cl. 352-11.000.

Paretti, Frank J.: *See*—
Harris, Linda D.; Paretti, Frank J.; and McWhorter, Sharon L., 4,256,281, Cl. 248-231.000.

Parker-Hannifin Corporation: *See*—
Grahl, Darwin R.; and Krause, Walter O., 4,255,940, Cl. 62-324.300.
Sharp, Bernard C., 4,256,375, Cl. 350-289.000.

Parsons, Roger C.: *See*—
Hopkins, Robert M.; and Parsons, Roger C., 4,256,188, Cl. 175-18.000.

Partain, Larry D.; and Lakshminarayana, Mysore R., to Abramo, John V.; and Abramo, Samuel V. Resonant circuit sensor of multiple properties of objects. 4,257,001, Cl. 324-58.50C.

Partners Limited, The: *See*—
Turpin, Raymond C., Jr., 4,256,500, Cl. 106-88.000.

Paschke, Richard H.: *See*—
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,256,529, Cl. 156-515.000.

Pascucci, Eugene: *See*—
Tomassini, Osvaldo, 4,256,970, Cl. 290-53.000.

Pasechnik, Nikolai V.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Kogos, Aizik M.; Rymarenko, Leonid I.; Makeev, Igor M.; and Pasechnik, Nikolai V., 4,255,957, Cl. 72-279.000.

Patel, Jayantilal S., to Eubanks Engineering Co. Automatic wire stacker apparatus. 4,256,427, Cl. 414-77.000.

Patel, Natu R.: *See*—
Hoffmann, Otto L.; and Patel, Natu R., 4,256,884, Cl. 544-240.000.

Patelhold Patentverwertungs- & Elektro-Holding AG: *See*—
Snedkerud, Ole, 4,257,122, Cl. 455-91.000.

Patil, Arvind S.; and Netherton, Lowell E., to BASF Wyandotte Corporation. Iron oxide pigments with improved color strength. 4,256,508, Cl. 156-304.000.

Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Machine for forming openings sealed by manually removable lengths of tape in can ends. 4,256,528, Cl. 156-514.000.

Paust, Joachim: *See*—
Jaedicke, Hagen; and Paust, Joachim, 4,256,643, Cl. 260-340.700.

Pavelek, Joseph M.: *See*—
Lewis, Ronald G.; and Pavelek, Joseph M., 4,256,600, Cl. 252-132.000.

Pawlowski, Thomas D., to American Can Company. Dual compartment display carton. 4,256,223, Cl. 206-45.110.

Pawluk, Robert J.: *See*—
Rothermel, Joel E.; and Pawluk, Robert J., 4,255,820, Cl. 3-1.000.

Pawson, Beverly A.: *See*—
Klaus, Michael J.; and Pawson, Beverly A., 4,256,878, Cl. 542-412.000.

Paxinos, James: *See*—
Mylrea, Kenneth C., 4,256,103, Cl. 128-214.00R.

Pay Television Corporation: *See*—
Papay, Joseph M., 4,257,065, Cl. 358-172.000.

Payne, Thomas R.; and Baker, Alfred L., to General Electric Company. Repetition rate power control for appliance using high current inrush elements. 4,256,951, Cl. 219-492.000.

Pecher, Wolfgang: *See*—
Dietrich, Rolf; Hafner, Heinz; and Pecher, Wolfgang, 4,256,393, Cl. 354-145.000.

Peirson, Robert C.; Vanada, James R.; and Donatelli, Paul C., to Aluminum Company of America. Nominal adaptive control using most recent excursion in a property variation. 4,257,093, Cl. 364-105.000.

Pennwalt Corporation: *See*—
McLaughlin, Hugh D., Jr., 4,256,602, Cl. 252-142.000.

Peppmoller, Reinmar: *See*—
Stockhausen, Dolf; and Peppmoller, Reinmar, 4,256,800, Cl. 428-245.000.

Peress, Jimmy: *See*—
Jung, John A.; and Peress, Jimmy, 4,256,913, Cl. 562-521.000.

Peri, Giorgio: *See*—
Brusaglino, Giampiero; and Peri, Giorgio, 4,256,997, Cl. 318-254.000.

Perica, Jacob E.; Poyer, Wayne F.; and Koenig, Neale F., to Perica, Jacob E. Cardiac monitor with stop watch means. 4,256,117, Cl. 128-690.000.

Perma Scand AB: *See*—
Roos, Bertil; and Ullman, Anders, 4,256,586, Cl. 210-487.000.

PermaGrain Products, Inc.: *See*—
Witt, Alvin E.; and Bosco, Lewis R., 4,256,798, Cl. 428-215.000.

Pershina, Nina F.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.

Pertchik, Samuel. Cushion for decubitus ulcers. 4,255,824, Cl. 5-441.000.

Pete, Leslie A.: *See*—
Smith, Tommy L.; Dierickx, Edward G.; Schade, Walter B., Jr.; and Pete, Leslie A., 4,256,304, Cl. 273-60.00B.

Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Relay valve for fluid actuators. 4,256,141, Cl. 137-557.000.

Petersen, Otto; and Schmidt, Hans-Dieter, to Bayer Aktiengesellschaft. Electrochemical detection of phosgene in gas mixtures. 4,256,543, Cl. 204-1.00T.

Peterson, Raymond S. Handle-equipped bowling ball. 4,256,305, Cl. 273-64.000.

Peterson, Robert R., to Barry Wright Corporation. Laminated bearing structures. 4,256,354, Cl. 308-139.000.

Petrak, Heinz; Vieweg, Gunther; and Weinicke, Martin, to Siemens Aktiengesellschaft. Needle journal bearing for a magnetically supported rotor shaft of a measuring instrument. 4,256,352, Cl. 308-10.000.

Petrie, John A. Beveled retaining ring and method for constructing the same. 4,256,010, Cl. 411-518.000.

Petrovich, Vojislav. Froth flotation method for recovering metal values from their ores by thiourea or substituted thiourea. 4,256,227, Cl. 209-166.000.

Pfizer Inc.: *See*—
Barth, Wayne E., 4,256,733, Cl. 424-114.000.
Rodrian, Richard H., 4,256,484, Cl. 75-0.5AA.
Vinick, Fredric J., 4,256,897, Cl. 548-183.000.

Philagro: *See*—
Guigues, Francois; Mourier, Jacqueline; and Demozay, Daniel, 4,256,480, Cl. 71-88.000.
Michelet, Daniel; and Rakoutz, Michel, 4,256,647, Cl. 260-346.220.

Philip Morris Incorporated: *See*—
Lendvay, Andrew T.; Wakeham, Helmut R. R.; and Keritsis, Gus D., 4,256,123, Cl. 131-17.00A.
Seligman, Robert B.; and Keritsis, Gus D., 4,256,126, Cl. 131-17.00A.

Phillips Petroleum Company: *See*—
Kallenberger, Robert H., 4,256,720, Cl. 423-449.000.
Lacy, Robert H., 4,257,098, Cl. 364-200.000.
Macdonell, Gary D., 4,256,903, Cl. 549-87.000.
Naylor, Floyd E.; and Wright, Roy F., 4,256,853, Cl. 525-92.000.
Roberts, John S.; Bertus, Brent J.; and McKay, Dwight L., 4,256,564, Cl. 208-120.000.
Stewart, Charles M.; and Killebrew, Wilbur N., Jr., 4,257,105, Cl. 364-501.000.
Thorsrud, Agmund K., 4,256,850, Cl. 521-139.000.
Walker, Starnes E., 4,256,404, Cl. 356-316.000.

Phillips, Reginald A., to Dobson Park Industries Limited. Impact type tools. 4,256,145, Cl. 138-31.000.

Pickens, Donald: *See*—
Mathew, Chempolil T.; and Pickens, Donald, 4,256,668, Cl. 564-255.000.

Pickering, Terence J.: *See*—
Morris, Roy; and Pickering, Terence J., 4,256,968, Cl. 250-560.000.

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Gonin, Roger B.; Fontanes, Sylvain; and Picquendar, Jean E., 4,257,019, Cl. 333-165.000.

Pier St. Flux concentrating solar fluid heater. 4,256,091, Cl. 126-438.000.

Piggott, Richard G. Spray head. 4,256,260, Cl. 239-119.000.

Pike, Charles T.; Furumoto, Horace W.; and Levin, Lawrence A., to Jersey Nuclear-Avco Isotopes, Inc. Adiabatic inversion for selective excitation. 4,257,013, Cl. 331-94.50P.

Pikhtovnikov, Boris I.: *See*—
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.

Piliavin, Michael A.; and Csanky, Geza, to Hughes Aircraft Company. Liquid crystal devices having uniform thermal expansion coefficient components. 4,256,382, Cl. 350-334.000.

Pinard, Patrick: *See*—
Prieur, Lucien; and Pinard, Patrick, 4,256,297, Cl. 271-207.000.

Pinckaers, B. Hubert, to Honeywell Inc. Alternating polarity power supply control apparatus. 4,256,978, Cl. 307-584.000.

Pingree, Robert J. Trowel means for lining and smoothing the interior of pipes with a protective coating. 4,256,445, Cl. 425-101.000.

Pink, Hans: *See*—
Krueger, Hans; and Pink, Hans, 4,256,377, Cl. 350-340.000.

Pinkerton, Carl A. Automatic chimney cap. 4,256,257, Cl. 236-1.00G.

Pisarenko, Vladimir M.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Pitroda, Satyan G.; Fechalos, William A.; and Stehman, Carl J., to Wescom Switching, Inc. Microprocessor control complex for a telecommunication switching system. 4,256,926, Cl. 179-18.0ES.

Pitroda, Satyan G., to Wescom Switching, Inc. PCM switching system for wide and narrow band signals. 4,257,119, Cl. 370-58.000.

Placer Exploration Limited: *See*—
Black, Archie L., 4,256,811, Cl. 428-562.000.

PLC Pharmaceutical Licenses Co. Ltd.: *See*—
Griengl, Herfried; and Foidl, Gabriele, 4,256,764, Cl. 424-285.000.

Ploussios, George. Large element antenna array with grouped overlapped apertures. 4,257,050, Cl. 343-854.000.

Plug, Jan: *See*—
Van Ginkel, Mannes; and Plug, Jan, 4,255,831, Cl. 17-11.000.
van Ginkel, Mannes; and Plug, Jan, 4,255,832, Cl. 17-11.000.

Plumley, Roger D.: *See*—
Black, Sigmund; Lagowski, Joseph V.; Whitt, Jerry C.; and Plumley, Roger D., 4,256,343, Cl. 299-31.000.

Pneumafil Corporation: *See*—
Smith, James B.; and Whitney, Craig B., 4,256,130, Cl. 137-1.000.

Poclain Hydraulics: *See*—
Badoureaux, Jean-Pierre; and Cheylus, Jean-Francois, 4,256,018, Cl. 92-58.000.

Podosek, Edward, to National Blank Book Company, Inc. File folder with integral loose leaf binder rings. 4,256,411, Cl. 402-73.000.

Pogge, Hans B., to International Business Machines Corporation. Method for forming a narrow dimensioned region on a body. 4,256,514, Cl. 148-1.500.

Pogrzeba, Hans J.: *See*—
Heyn, Klaus; and Pogrzeba, Hans J., 4,255,926, Cl. 60-39.120.

Poland, Terrell A.: *See*—
McCullough, J. Warren; Poland, Terrell A.; Reynolds, Dale N.; Slack, Keith K.; and Turner, Richard T., 4,257,096, Cl. 364-200.000.

Polaroid Corporation: *See*—
Green, Lawrence E., 4,256,527, Cl. 156-443.000.
Johnson, Bruce K.; and Morse, John B., 4,256,395, Cl. 354-180.000.
Kniazzeh, Alfredo G., 4,256,813, Cl. 429-86.000.
Taylor, Lloyd D., 4,256,614, Cl. 260-17.00A.

Pollock, James W.: *See*—
Witzke, Horst; and Pollock, James W., 4,257,046, Cl. 340-785.000.

Polster, Rudolf: *See*—
Kranz, Joachim; Polster, Rudolf; Sappok, Reinhard; and Wiesenberger, Alois, 4,256,507, Cl. 106-288.00Q.

Polymark Corporation: *See*—
Day, Ian H.; Baldwin, William A.; and Stern, Harold J., 4,256,795, Cl. 428-196.000.

Polysar Limited: *See*—
Buckler, Ernest J.; and Feniak, George, 4,256,857, Cl. 525-331.000.

Poma, Frank. Hollow sleeve brackets. 4,255,913, Cl. 52-297.000.

Ponomarev, Viktor I.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Ponsford, Roger J.; and Howarth, Thomas T., to Beecham Group Limited. Process for manufacture of 9-amino-9-deoxyclavulanates. 4,256,638, Cl. 260-245.300.

Popelish, John A.: *See*—
Lindsay, Donald S.; Menk, Charles J.; and Popelish, John A., 4,257,051, Cl. 346-74.500.

Popp, Gerhard; Saturno, Patrick H.; and Stephen, Keith H., to Eastman Kodak Company. Bleach-fix sheets. 4,256,826, Cl. 430-213.000.

Portec, Inc.: *See*—
Gore, William C., 4,256,259, Cl. 238-160.000.

Porter, Arthur C.: *See*—
Turns, Earl W.; Forrester, Robert E., Jr.; and Porter, Arthur C., 4,256,547, Cl. 204-35.00N.

Porter, David R.; Reese, Irving R.; and Von Bokern, Greg J., to Boeing Company, The. Optical repeater for use in active multiport fiber optic data bus coupler. 4,257,124, Cl. 455-601.000.

Porter, Mark W.: *See*—
Copley, Russell D.; Schlueter, Francis E.; and Porter, Mark W., 4,255,919, Cl. 56-30.000.

Porter, Raymond P., to Acushnet Company. Heat treatment of windshield wiper blades. 4,256,683, Cl. 264-157.000.

Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James H., 4,255,993, Cl. 83-71.000.

Pottharst, Jurgen: *See*—
Wessel, Gerhard; Pottharst, Jurgen; and Koger, Kurt, 4,256,383, Cl. 350-343.000.

Pound, Thomas C.: *See*—
Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., 4,256,807, Cl. 428-379.000.

Powell, Frederic D., to Simmonds Precision Products, Inc. Combination water contaminant and fuel density detector. 4,256,403, Cl. 356-73.000.

Poyer, Wayne F.: *See*—
Perica, Jacob E.; Poyer, Wayne F.; and Koenig, Neale F., 4,256,117, Cl. 128-690.000.

Poznanovic, Milenko. Method for the fractionation of green plants for fodder and a device used in the method. 4,256,033, Cl. 100-37.000.

PPG Industries, Inc.: *See*—
Buchwalter, Stephen L.; Jerabek, Robert D.; Chou, Lee-Pei H.; and Christenson, Roger M., 4,256,560, Cl. 204-181.00C.
Tsai, Yih-Wan; and Duffus, Robert H., 4,256,173, Cl. 165-9.300.

PQ Corporation: *See*—
Cassella, Vincent J.; and Irani, Mazin R., 4,256,577, Cl. 210-738.000.

President and Fellows of Harvard College: *See*—
Goldhaber, Paul, 4,256,743, Cl. 424-247.000.

Pretzel, Dieter: *See*—
Dubiel, Oswald; and Pretzel, Dieter, 4,256,210, Cl. 192-99.00A.

Prewo, Karl M.; and Stalcup, Robert K., to United Technologies Corporation. Graphite-glass composite laser mirror. 4,256,378, Cl. 350-310.000.

Prichard, Thomas H.: *See*—
Harrison, Roger G., Jr.; and Prichard, Thomas H., 4,256,876, Cl. 536-12.000.

Priday, Jim H.: *See*—
Winters, Thomas B.; and Priday, Jim H., 4,256,216, Cl. 198-488.000.

Prieur, Lucien; and Pinard, Patrick, to Compagnie Internationale pour l'Informatique. Hopper. 4,256,297, Cl. 271-207.000.

Prince Corporation: *See*—
Prince, Edgar D., 4,256,166, Cl. 164-154.000.

Prince, Edgar D., to Prince Corporation. Tie bar adjustment system. 4,256,166, Cl. 164-154.000.

Prines, Frank J.; Matty, Thomas C.; and Franz, James H., to Westinghouse Electric Corp. Traction motor current control apparatus. 4,257,092, Cl. 363-124.000.

Procter & Gamble Company, The: *See*—
Benedict, James J., 4,256,730, Cl. 424-52.000.
Sakkab, Nabil Y., 4,256,597, Cl. 252-99.000.
Sakkab, Nabil Y., 4,256,598, Cl. 252-99.000.
Strobel, Rudolf G. K.; and Eich, Richard A., 4,256,774, Cl. 426-428.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Gangneux, Philippe Y. E., 4,256,901, Cl. 548-268.000.

Prohl, Melvin A.: *See*—
Fischer, George A.; and Prohl, Melvin A., 4,256,353, Cl. 308-26.000.

Ptacek, Theodore C.: *See*—
Lester, Thomas J.; and Ptacek, Theodore C., 4,256,348, Cl. 301-64.00R.

Pugel, Joseph P. Wheel change mechanism. 4,256,430, Cl. 414-428.000.

Pullman Incorporated: *See*—
Coccia, Larry A., 4,256,290, Cl. 266-191.000.

Purdue Research Foundation: *See*—
Newhouse, Vernon L.; and LeCong, Phung, 4,255,977, Cl. 73-861.250.

Pyreflex Corp.: *See*—
Berg, Charles A., 4,256,919, Cl. 13-23.000.

Quagliarello, Giuseppe: *See*—
Masdea, Arturo; and Quagliarello, Giuseppe, 4,257,018, Cl. 333-17.00R.

Quatrini, Lucretia R., to GTE Products Corporation. Process for recovering tungsten from cemented tungsten carbide. 4,256,708, Cl. 423-61.000.

Quester, Karl W.; Haas, Johannes; Ulbrich, Hans-Joachim; and Schroder, Dieter. Method of and apparatus for the operation of treatment processes for bulk goods and the like. 4,255,869, Cl. 34-25.000.

Quigley, Richard J.: *See*—
Reynolds, Clarke; and Quigley, Richard J., 4,255,903, Cl. 49-498.000.

Quitadamo, Dominick J. Multiple target weapons system. 4,256,013, Cl. 89-41.0TV.

R & D Office Makoto Ltd.: *See*—
Ikeda, Makoto, 4,256,312, Cl. 369-269.000.

R. T. French Co., The: *See*—
Whitty, Parnell, 4,256,078, Cl. 125-3.000.

Raduchel, Bernd: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,256,745, Cl. 424-248.550.

Ragettli, Christian. Calibrating apparatus for inside and outside surfaces and alignment of pipe sections. 4,255,860, Cl. 33-143.00L.

Rahnke, Christian J.; and Cook, Jeffrey A., to Ford Motor Company. Heat exchanger matrix configuration with high thermal shock resistance. 4,256,172, Cl. 165-8.000.

Rainey, Don E. Preservation of perishable comestibles. 4,256,770, Cl. 426-124.000.

Raju, Bendapudi P.: *See—*
Bartram, Trevor C.; and Raju, Bendapudi P., 4,257,080, Cl. 361-19.000.

Rakoutz, Michel: *See—*
Michelet, Daniel; and Rakoutz, Michel, 4,256,647, Cl. 260-346.220.

Ramanarayanan, Madhava P.: *See—*
Ali, Majid; Nalebuft, Donald; Fayemi, Alfred; Ramanarayanan, Madhava P.; and Mesa-Tejada, Ricardo, 4,256,833, Cl. 435-7.000.

Ramshaw, Colin: *See—*
Cliff, Michael J.; Cross, William T.; and Ramshaw, Colin, 4,256,551, Cl. 204-98.000.

Ramuz, Henri: *See—*
Muller, Jean-Claude; and Ramuz, Henri, 4,256,886, Cl. 544-323.000.

Raniere, Frederick D.: *See—*
Friedman, Joseph; Hines, William S.; Raniere, Frederick D.; and Silverman, Jacob, 4,256,565, Cl. 208-129.000.

Ranks Hovis McDougall Limited: *See—*
Solomons, Gerald L.; and LeGrys, Geoffrey A., 4,256,839, Cl. 435-314.000.

Ranney, Richard D.: *See—*
Rounds, Michael F.; and Ranney, Richard D., 4,257,038, Cl. 340-539.000.

Raschig GmbH: *See—*
Braun, Roland, 4,256,673, Cl. 261-94.000.

Raue, Roderich, to Bayer Aktiengesellschaft. Fluorescent azolyl benzocoumarin dyestuffs. 4,256,900, Cl. 548-262.000.

Raue, Roderich: *See—*
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,256,882, Cl. 544-212.000.

Ravis, James C., to United States of America, Army. Regulated variable frequency DC/DC converter. 4,257,089, Cl. 363-25.000.

Ray, Asim B., to Research-Cottrell, Inc. Process for desulfurization of coal. 4,256,464, Cl. 44-1.0SR.

Ray, Asim B.: *See—*
Atkins, Richard S.; and Ray, Asim B., 4,256,712, Cl. 423-242.000.

Raybestos-Manhattan, Incorporated: *See—*
Chuluda, Philip A., 4,256,801, Cl. 428-280.000.

RCA Corporation: *See—*
Allen, James A.; and Miller, Michael E., 4,256,311, Cl. 369-170.000.
Hang, Kenneth W.; and Anderson, Wayne M., 4,256,796, Cl. 428-210.000.
Johnson, Raymond V.; and Biondi, Dennis P., 4,256,052, Cl. 118-719.000.
Johnston, Loren B., 4,257,068, Cl. 358-242.000.
Yorkanis, Bernard J., 4,257,009, Cl. 330-51.000.

Read, James L., to F. T. Read & Sons, Inc. Portable screening plant with outfeed conveyor. 4,256,572, Cl. 209-257.000.

Recaro GmbH & Co.: *See—*
Goldner, Walter; and Strien, Werner, 4,256,341, Cl. 297-410.000.

Rederiaktiebolaget Nordstjernan: *See—*
Bergman, Sven A.; Ohlsson, Per J.; and Nordqvist, Karl-Gustav E., 4,257,010, Cl. 331-65.000.

Redetzky, Manfred, to Klockner Stahltechnik GmbH. Regulating valve for dividing a flow into a plurality of individual flows. 4,256,134, Cl. 137-118.000.

Reed Tool Company: *See—*
Jones, Kenneth W., 4,256,191, Cl. 175-93.000.

Rees, John M.: *See—*
Coaton, James R.; Rees, John M.; and Rothon, Roger N., 4,256,988, Cl. 313-221.000.

Reese, Eckart: *See—*
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, 4,256,862, Cl. 525-534.000.

Reese, Irving R.: *See—*
Porter, David R.; Reese, Irving R.; and Von Bokern, Greg J., 4,257,124, Cl. 455-601.000.

Refac Electronics Corporation: *See—*
Witzke, Horst; and Pollock, James W., 4,257,046, Cl. 340-785.000.

Regan, Michael T.: *See—*
Webster, Frank G.; and Regan, Michael T., 4,256,819, Cl. 430-41.000.

Reich, Erhardt: *See—*
Horacek, Heinrich; Schoen, Ernst; Reich, Erhardt; and Volkert, Otto, 4,256,841, Cl. 521-51.000.

Reichert, Samuel F.: *See—*
Smilanich, Nicholas J.; and Reichert, Samuel F., 4,256,815, Cl. 429-185.000.

Reinsma, Harold L., to Caterpillar Tractor Co. Joint sealing structure. 4,256,316, Cl. 277-92.000.

Reisser, Gerd; and Lovas, Kurt, to Schubert and Salzer. Method for securing a reserve winding on a tube. 4,256,272, Cl. 242-18.0PW.

Relf, Graham T.: *See—*
Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., 4,255,966, Cl. 73-81.000.

Reneau, Bobby J.; and Manchester, Luther L., Jr. Pivotal ball check valve. 4,256,283, Cl. 251-62.000.

Rengo Co., Ltd.: *See—*
Itoga, Kiyoshi; Ogino, Fumiichi; Shirakawa, Kinichi; and Soga, Yasuyuki, 4,256,773, Cl. 426-415.000.

Renth, Ernst-Otto: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,256,756, Cl. 424-273.00R.

Reppert, Merlyn R. Spoked wheel. 4,256,347, Cl. 301-64.0SH.

Republic Steel Corporation: *See—*
Waid, George M.; and Davenport, Anthony T., 4,256,517, Cl. 148-36.000.

Research Corporation: *See—*
Bahl, Om P., 4,256,629, Cl. 260-112.00B.
Malley, Arthur, 4,256,732, Cl. 424-91.000.
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., 4,256,883, Cl. 544-235.000.

Research-Cottrell, Inc.: *See—*
Atkins, Richard S.; and Ray, Asim B., 4,256,712, Cl. 423-242.000.
Ray, Asim B., 4,256,464, Cl. 44-1.0SR.

Research Engineering & Manufacturing, Inc.: *See—*
Muenchinger, Herman G., 4,255,959, Cl. 72-469.000.

Resource Development Consultants Ltd.: *See—*
Hopkins, Robert M.; and Parsons, Roger C., 4,256,188, Cl. 175-18.000.

Reuss, Mira: *See—*
Krisp, Werner; Malkowski, Rainer; and Reuss, Mira, 4,256,599, Cl. 252-99.000.

Reuter, Wolfgang: *See—*
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.

Rexnord Inc.: *See—*
Dieringer, Andrew M., 4,256,040, Cl. 104-17.00R.

Reynolds, Christopher H. Display device. 4,257,084, Cl. 362-31.000.

Reynolds, Clarke; and Quigley, Richard J. Snap-together sealing gasket. 4,255,903, Cl. 49-498.000.

Reynolds, Dale N.: *See—*
McCullough, J. Warren; Poland, Terrell A.; Reynolds, Dale N.; Slack, Keith K.; and Turner, Richard T., 4,257,096, Cl. 364-200.000.

Reynolds Metals Company: *See—*
Scott, Charles E.; and Dewey, John L., 4,256,714, Cl. 423-295.000.

Rhone-Poulenc Textile: *See—*
Achard, Georges; Anouilh, Gilbert; Chion, Pierre; and Vincent, Roger, 4,256,684, Cl. 264-168.000.

Rhonehouse, Richard L.: *See—*
Stamper, Richard W.; and Rhonehouse, Richard L., 4,256,797, Cl. 428-215.000.

Ricci, Roberto: *See—*
Dellepiane, Enrico; Ricci, Roberto; and Timossi, Giovanni, 4,256,291, Cl. 266-272.000.

Rice, Wayne K., to Vitamins, Inc. Extruded wheat germ food product and method of preparation. 4,256,769, Cl. 426-72.000.

Richardson, Frederick J., to Northwest Ecological Research & Development, Inc. Enzyme oxidation of sulfides in minerals. 4,256,485, Cl. 75-6.000.

Richardson, William R.: *See—*
Boyer, Adrian J.; Richardson, William R.; Metcalfe, Robert J.; and Foden, Peter J., 4,255,823, Cl. 5-81.00R.

Richter, Gunter; and Froschle, Reinhard, to Maschinenfabrik Gehring K.G. Control system for the stroke limitation of a machine tool element. 4,256,999, Cl. 318-560.000.

Ricks, Michael J.: *See—*
Malhotra, Sudarshan K.; and Ricks, Michael J., 4,256,893, Cl. 546-301.000.

Ricoh Company, Ltd.: *See—*
Enomoto, Takamichi; Katoh, Tatuya; Kozima, Akio; and Satoh, Tatsumi, 4,256,821, Cl. 430-59.000.
Fujimura, Itaru; Nakamura, Hitoshi; Kuroishi, Shoji; Seko, Nachio; and Ogawa, Toshiyuki, 4,256,401, Cl. 355-14.00E.
Ishikawa, Chuji, 4,257,054, Cl. 346-155.000.
Murayama, Noboru; and Taniguchi, Hayashi, 4,257,069, Cl. 358-261.000.

Riedel, Peter, to ITT Industries, Inc. Tandem master cylinder. 4,255,932, Cl. 60-562.000.

Riew, Changkiu K., to B. F. Goodrich Company, The. Reactive liquid polymers. 4,256,904, Cl. 560-104.000.

Rigaku Industrial Corporation: *See—*
Shoji, Takashi; and Utaka, Tadashi, 4,256,961, Cl. 250-272.000.

Rigon, Pietro L., to Rigon, S.P.A. Boots of injection molded plastic and process therefor. 4,255,825, Cl. 12-142.0RS.

Rigon, S.P.A.: *See—*
Rigon, Pietro L., 4,255,825, Cl. 12-142.0RS.

Rimmele, Karl, to Mecafina S.A. Waste water purifying plant. 4,256,580, Cl. 210-151.000.

Ringwald, Peter: *See—*
Rose, Klaus; Kemmner, Ulrich; and Ringwald, Peter, 4,256,579, Cl. 210-90.000.

Ritter, Heinz: *See—*
Sauer, Hans; Steinbichler, Wolf; Ritter, Heinz; and Antonitsch, Sepp, 4,257,081, Cl. 361-156.000.

Robert Bosch GmbH: *See—*
Leiber, Heinz; and Mergenthaler, Robert, 4,255,931, Cl. 60-547.00A.

Rose, Klaus; Kemmner, Ulrich; and Ringwald, Peter, 4,256,579, Cl. 210-90.000.
Schillinger, Rainer, 4,256,438, Cl. 417-53.000.
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.

Roberts, David E.: *See*—
Smith, Jack E.; Roberts, David E.; and Jalbing, John I., 4,256,700, Cl. 422-177.000.

Roberts, John S.; Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Cracking process and catalyst for same containing indium to passivate contaminating metals. 4,256,564, Cl. 208-120.000.

Roberts, Philip D.: *See*—
McOnie, Malcolm P.; and Roberts, Philip D., 4,256,863, Cl. 526-62.000.

Robertson, James T.: *See*—
Kapp, John P.; Robertson, James T.; and Tucker, Elton M., 4,256,094, Cl. 128-24.00R.

Rockwell International Corporation: *See*—
Cheung, Derek T.; Andrews, A. Mike, II; and Longo, Joseph T., 4,257,057, Cl. 357-24.000.
Eshghy, Siavash, 4,255,846, Cl. 29-407.000.
Friedman, Joseph; Hines, William S.; Raniere, Frederick D.; and Silverman, Jacob, 4,256,565, Cl. 208-129.000.
Lackman, Leslie M.; and Hill, John A., 4,256,790, Cl. 428-73.000.
Lee, Steven N., 4,256,229, Cl. 211-41.000.
Padgett, Clarence W.; and Marmet, Melvin L., 4,256,974, Cl. 307-475.000.
Soohoo, Jack E.; McNutt, Michael J.; Yao, Shi-Kay; Hayes, Cecil L.; and Gudmundsen, Richard A., 4,257,111, Cl. 365-114.000.

Rodrian, Richard H., to Pfizer Inc. Metallic iron particles for magnetic recording. 4,256,484, Cl. 75-0.5AA.

Rody, Jean: *See*—
Moser, Paul; Rody, Jean; and Karrer, Friedrich, 4,256,627, Cl. 260-45.75N.

Rogers, Norman H.: *See*—
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,256,762, Cl. 424-283.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,256,879, Cl. 542-427.000.

Roggow, Mervin A.; and Stiver, J. Harold, to Energy Concerns, Inc. Heat-exchanging system. 4,256,059, Cl. 122-32.000.

Rohm and Haas Company: *See*—
Larsson, Bjorn E.; and Desiderio, Fred A., 4,256,809, Cl. 428-473.000.
Meitzner, Erich F.; and Oline, James A., 4,256,840, Cl. 521-33.000.

Rojas, Miguel E. Hole cutting apparatus. 4,256,288, Cl. 266-70.000.

Roll-A-Vision, Inc.: *See*—
Logan, Corrigan D., 4,255,889, Cl. 40-518.000.

Rolls-Royce Limited: *See*—
Stevenson, David R., 4,256,255, Cl. 228-175.000.
Wilson, John F.; and Towler, Brian, 4,256,555, Cl. 204-129.500.

Rompeltien, Rainer: *See*—
Zajicek, Otmar; Kirschner, Jurgen; Klapp, Helmut; and Rompeltien, Rainer, 4,256,470, Cl. 55-48.000.

Rontgen Technische Dienst B.V.: *See*—
Dijkstra, Durk, 4,255,972, Cl. 73-634.000.

Rooney, Clarence S.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,256,758, Cl. 424-274.000.

Rooney, John J.: *See*—
Dale, Robert W.; and Rooney, John J., 4,256,609, Cl. 252-455.00Z.

Roos, Bertil; and Ullman, Anders, to Perma Scand AB. Frame for bag-type filters. 4,256,586, Cl. 210-487.000.

Roos, Ernst; Bartl, Herbert; Schuster, Klaus; and Schmidt, Adolf, to Bayer Aktiengesellschaft. Azo-di-isobutyric acid-(N,N-hydroxyalkyl)-amidines. 4,256,636, Cl. 260-192.000.

Rose, Gerard: *See*—
Boutonnat, Maurice; and Rose, Gerard, 4,255,960, Cl. 73-27.00R.

Rose, Klaus; Kemmner, Ulrich; and Ringwald, Peter, to Robert Bosch GmbH. Filter for liquids. 4,256,579, Cl. 210-90.000.

Rosen, Frank L.: *See*—
DeCarlo, Frank S.; Rosen, Frank L.; and Goetz, Walter J., 4,255,979, Cl. 74-5.470.

Rosen, Perry: *See*—
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,256,911, Cl. 560-227.000.

Rosenberg, Avner: *See*—
Rosenberg, Peretz; and Rosenberg, Avner, 4,256,262, Cl. 239-276.000.

Rosenberg, David. Window insulating device. 4,255,908, Cl. 52-2.000.

Rosenberg, Knut A.: *See*—
Holmstrom, Sven N. H.; and Rosenberg, Knut A., 4,256,791, Cl. 428-77.000.

Rosenberg, Peretz; and Rosenberg, Avner. Mounting for water irrigation device. 4,256,262, Cl. 239-276.000.

Rosencwaig, Allan. Thermoacoustic microscopy. 4,255,971, Cl. 73-606.000.

Roth, Walter, to BBC Brown, Boveri & Company, Limited. Apparatus for inserting and withdrawing subassemblies. 4,256,356, Cl. 312-320.000.

Rothermel, Joel E.; and Pawluk, Robert J. Artificial ligaments. 4,255,820, Cl. 3-1.000.

Rothon, Roger N.: *See*—
Coaton, James R.; Rees, John M.; and Rothon, Roger N., 4,256,988, Cl. 313-221.000.

Rotor Tool Company: *See*—
Cioili, Donald A., 4,255,987, Cl. 74-768.000.

Rounds, Michael F.; and Ranney, Richard D., to Notifier Company. Coded security system. 4,257,038, Cl. 340-539.000.

Rowe International, Inc.: *See*—
Verduin, Lee C.; and Kitchka, Paul E., 4,256,009, Cl. 84-464.00R.

Rowe, Murray A.; Conway, Robert T.; Glesmann, Herbert C.; and Kruse, Richard W., to CMI Corporation. Concrete vibrator machine. 4,256,415, Cl. 404-116.000.

Roy, Ram B.; Ostehsson, Lars B.; and Westin, Rolf B., to Studsvik Energiteknik AB. Method and means for reducing heat transmission through a window. 4,256,808, Cl. 428-421.000.

Ruchinsky, Vitaly R.: *See*—
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kirkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.

Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for cutting paper webs or the like. 4,255,998, Cl. 83-298.000.

Ruff, Robert O., to American Standard Inc. Weather sealing assembly for doors. 4,255,902, Cl. 49-488.000.

Ruin, Jean, to Mitchell S.A. Fishing reels. 4,256,271, Cl. 242-84.20G.

Rule Medical Instruments, Inc.: *See*—
Levy, Donald; and Rusz, Tibor, 4,256,100, Cl. 128-204.210.

Rusaev, Vladimir I.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Russell, Edwin L.; and Clontz, Norvin A., to Milliken Research Corporation. Process for dyeing closely constructed non-tufted textile materials and products produced thereby. 4,256,459, Cl. 8-471.000.

Russold, Frank J., to Kreonite Inc. Anti-skiving device for photographic film. 4,256,001, Cl. 83-869.000.

Rusz, Tibor: *See*—
Levy, Donald; and Rusz, Tibor, 4,256,100, Cl. 128-204.210.

Rutgerswerke Aktiengesellschaft: *See*—
Maurer, Manfred; Orth, Winfried; and Fickert, Werner, 4,256,892, Cl. 546-261.000.

Ruthner, Othmar. Method and apparatus for the improvement of storage of biochemical energy in plants. 4,255,897, Cl. 47-65.000.

Rutimann, Peter: *See*—
Bruhin, Rolf; and Rutimann, Peter, 4,257,030, Cl. 340-149.00R.

Rutner, Herman; and Dodd, Thomas F., to Becton, Dickinson and Company. Method for non-covalent coating of antibodies on solid substrates. 4,256,724, Cl. 424-1.000.

Rutner, Herman; and Dodd, Thomas F., to Becton, Dickinson and Company. Preparation of solid substrate containing receptor and labeled form of ligand for assays. 4,256,725, Cl. 424-1.000.

Ruyssers, Robert H. M.: *See*—
Grymonprez, Paul A.; Ruyssers, Robert H. M.; and Barker, Brian G., 4,255,967, Cl. 73-168.000.

RWC, Inc.: *See*—
Lain, Ronald G., 4,256,221, Cl. 198-345.000.

Ryan, Kelly P., to Blair Manufacturing Company. Hydraulic circuit cooling system for silage compactors. 4,256,031, Cl. 100-65.000.

Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,256,952, Cl. 219-521.000.

Ryder International Corporation: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,256,952, Cl. 219-521.000.

Rymarenko, Leonid I.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Kogos, Aizik M.; Rymarenko, Leonid I.; Makeev, Igor M.; and Pasechnik, Nikolai V., 4,255,957, Cl. 72-279.000.

Ryon, Donald C., to Motorola, Inc. Musical instrument tuner with incremental scale shift. 4,256,008, Cl. 84-454.000.

Rysek, Joseph J., to Lubrizol Corporation, The. Hot melt metal working lubricants containing phosphorus-containing compositions. 4,256,594, Cl. 252-49.900.

Sabba, Pierluigi, to NESPAK S.p.A. Societa Generale per l'Imballaggio. Vacuum forming method. 4,256,690, Cl. 264-504.000.

St. Vincent, Craig J.: *See*—
Goda, Boyd D.; Simpson, Thomas E.; St. Vincent, Craig J.; and Collura, Peter C., 4,256,025, Cl. 493-160.000.

Saitoh, Osamu: *See*—
Ishida, Kozo; Saitoh, Osamu; and Imaki, Takao, 4,256,964, Cl. 250-345.000.

Sakaguchi, Haruo: *See*—
Ota, Chuichi; Seki, Norio; and Sakaguchi, Haruo, 4,257,033, Cl. 340-870.160.

Sakaguchi, Shinji: *See*—
Noguchi, Yasuhiro; Sakaguchi, Shinji; and Yoshida, Takashi, 4,256,827, Cl. 430-215.000.

Sakai, Fumihiko: *See*—
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, 4,256,914, Cl. 562-535.000.

Sakai, Yoshio: *See*—
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.

Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki Kaisha. Method and apparatus using multiple deflections for reproducing a halftone image by scanning. 4,257,072, Cl. 358-298.000.

Sakkab, Nabil Y., to Procter & Gamble Company, The. Composition for combined washing and bleaching of fabrics. 4,256,597, Cl. 252-99.000.

Sakkab, Nabil Y., to Procter & Gamble Company, The. Composition for combined washing and bleaching of fabrics. 4,256,598, Cl. 252-99.000.

Sakoe, Hiroaki, to Nippon Electric Co., Ltd. Device for recognizing an input pattern with approximate patterns used for reference patterns on mapping. 4,256,924, Cl. 179-1.0SD.

Sakura Color Products Corp.: *See—*
Yamamoto, Masaji; Shioi, Keiko; and Murakami, Kimio, 4,256,494, Cl. 106-22.000.

Salvano, Lori, to Zaromb, Solomon. Plant cultivation devices and methods. 4,256,046, Cl. 111-1.000.

Samuels, Basil J.; and Besseling, Johann L. N. Electrical control arrangement. 4,256,998, Cl. 318-335.000.

Sanders, Norman T., to Needle Industries Limited. Stress reducing latch needle shank. 4,255,948, Cl. 66-123.000.

Sando Iron Works Co. Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,255,951, Cl. 68-22.00R.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co. Ltd. Device for continuously impregnating cloth material with liquid. 4,255,951, Cl. 68-22.00R.

Sandoz Ltd.: *See—*
Greve, Manfred, 4,256,635, Cl. 260-156.000.

Sandvik Ab, Fack & Aktiebolaget SKF: *See—*
Kunkel, Heinrich; Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,256,193, Cl. 175-371.000.

Sandvik Conveyor GmbH: *See—*
Boman, Karl G.; and Schermutzki, Konrad, 4,256,581, Cl. 210-173.000.

Sanville, W. Woodward, to Servo Corporation of America. Railway freight car identification system. 4,256,278, Cl. 246-247.000.

Saperstein, Zalman P., to Modine Manufacturing Company. Heat exchanger. 4,256,177, Cl. 165-151.000.

Sappok, Reinhard: *See—*
Kranz, Joachim; Polster, Rudolf; Sappok, Reinhard; and Wiesenberger, Alois, 4,256,507, Cl. 106-288.00Q.

Sardemann, Jurgen: *See—*
von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, 4,256,165, Cl. 164-147.000.

Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, to Toyo Soda Manufacturing Company, Limited. Hydrophilic separating carrier and preparation thereof. 4,256,842, Cl. 521-53.000.

Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, to Toyo Soda Manufacturing Company, Limited. Hydrophilic separating carrier and preparation thereof. 4,256,843, Cl. 521-53.000.

Sasaki, Seiko: *See—*
Asano, Kazuhiro; and Sasaki, Seiko, 4,257,116, Cl. 368-69.000.

Sasatani, Takashi: *See—*
Makisumi, Yasuo; Takada, Susumu; Sasatani, Takashi; and Ishizuka, Natsuki, 4,256,640, Cl. 260-326.12A.

Satellite Business Systems: *See—*
Goode, Burwell, 4,256,925, Cl. 370-104.000.

Sato, Masaru: *See—*
Kaneko, Yoshiro; and Sato, Masaru, 4,257,066, Cl. 358-183.000.

Sato, Takahisa: *See—*
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, 4,256,783, Cl. 422-197.000.

Satoh, Heijiro: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.

Satoh, Masaru: *See—*
Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, 4,256,765, Cl. 424-315.000.

Satoh, Tatsumi: *See—*
Enomoto, Takamichi; Katoh, Tatuya; Kozima, Akio; and Satoh, Tatsumi, 4,256,821, Cl. 430-59.000.

Satou, Shigeru: *See—*
Horiba, Isao; Kuwabara, Yasuo; Takagi, Hiroshi; and Satou, Shigeru, 4,257,102, Cl. 364-414.000.

Saturno, Patrick H.: *See—*
Popp, Gerhard; Saturno, Patrick H.; and Stephen, Keith H., 4,256,826, Cl. 430-213.000.

Sauer, Donald G., to National Can Corporation. Draw-forming of stretchable thermoplastic material into hollow articles. 4,256,449, Cl. 425-388.000.

Sauer, Hans; Steinbichler, Wolf; Ritter, Heinz; and Antonitsch, Sepp, to Matsushita Electric Works Ltd.; and SDS-Electro GmbH. Circuit arrangement for the control of a bistable relay. 4,257,081, Cl. 361-156.000.

Sauerwein, Lewis E.; and Gross, Richard L., to AM International, Inc. Print wheel setting and control means in printing machines. 4,256,036, Cl. 101-45.000.

Saurer - Diederichs Societe Anonyme: *See—*
Deborde, Albert H., 4,256,147, Cl. 139-115.000.

Savey, Claude; and Laurent, Florent, to Societe Anonyme dite Stratiforme. Panel based on polycondensable resin and a method for the manufacture of this panel. 4,256,803, Cl. 428-315.000.

Savin Corporation: *See—*
Landa, Benzion, 4,256,820, Cl. 430-54.000.

SCA Development Aktiebolag: *See—*
Karlsson, Alf H.; Lundstrom, Hans E.; and Olsson, Lars-Henrik, 4,256,877, Cl. 536-59.000.

Scarbrough, Abb L.: *See—*
McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., 4,256,718, Cl. 423-419.00P.

Scarbrough, Don R., Sr.: *See—*
Cowart, William L.; Holland, Cropper W., Jr.; and Scarbrough, Don R., Sr., 4,256,012, Cl. 89-1.816.

Schade, Walter B., Jr.: *See—*
Smith, Tommy L.; Dierickx, Edward G.; Schade, Walter B., Jr.; and Pete, Leslie A., 4,256,304, Cl. 273-60.00B.

Schafer, Hans-Jurgen, to Volkswagenwerk Aktiengesellschaft. Internal combustion diesel engine. 4,256,062, Cl. 123-52.00M.

Schafer, James P., to Carrier Corporation. Heat transfer and storage system. 4,256,475, Cl. 62-2.000.

Schal, Wilfried: *See—*
Schindler, Johannes G.; and Schal, Wilfried, 4,256,561, Cl. 204-195.00M.

Schanefelt Robert V.: *See—*
Tuschhoff, John V.; Eastman, James E.; and Schanefelt Robert V., 4,256,509, Cl. 127-32.000.

Scharling, Henry E., II. Weaving apparatus and method. 4,256,148, Cl. 139-450.000.

Schatteman, Etienne A. M., to Staar S.A. Tape reversal control. 4,256,274, Cl. 242-201.000.

Schaumann, Rolf, to University of Minnesota, The Regents of the. Integrable analog active filter and method of same. 4,257,006, Cl. 328-127.000.

Scheinert, Karol V. Printed circuit board assembly fixture. 4,256,296, Cl. 269-45.000.

Schering Aktiengesellschaft: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,256,745, Cl. 424-248.550.

Schermutzki, Konrad: *See—*
Boman, Karl G.; and Schermutzki, Konrad, 4,256,581, Cl. 210-173.000.

Scherzinger, Rudolf, to Metal Sales Company (Proprietary) Limited. Porous metal agglomerates. 4,256,521, Cl. 149-6.000.

Schillinger, Eckehard: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,256,745, Cl. 424-248.550.

Schillinger, Rainer, to Robert Bosch GmbH. Method and apparatus for simultaneous noise damping on intake and pressure sides of fluid pumps. 4,256,438, Cl. 417-53.000.

Schindler, Johannes G.; and Schal, Wilfried, to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG. Electrochemical measuring electrode. 4,256,561, Cl. 204-195.00M.

Schlatter, Ralph L. Milk valve cover guard. 4,256,055, Cl. 119-14.030.

Schlinger, Warren C.; and Slater, William L., to Texaco Inc. Conversion of hydrogen and carbon monoxide into C_1–C_4 range hydrocarbons. 4,256,654, Cl. 260-449.60R.

Schlosberg, Richard H.; and Scouten, Charles G., to Exxon Research & Engineering Co. Removal of phenols from phenol-containing streams. 4,256,568, Cl. 208-263.000.

Schlueter, Francis E.: *See—*
Copley, Russell D.; Schlueter, Francis E.; and Porter, Mark W., 4,255,919, Cl. 56-30.000.

Schlueter, Roy; and Spector, George. Golf game target. 4,256,308, Cl. 273-177.00A.

Schlumberger Technology Corporation: *See—*
Goldschild, Pierre H.; and Franc, Jean, 4,256,282, Cl. 251-58.000.

Schmid, Frederick, to Crystal Systems Inc. Wire blades. 4,256,079, Cl. 125-17.000.

Schmid, Frederick; and Khattak, Chandra P., to Crystal Systems Inc. Crystal growing. 4,256,530, Cl. 156-600.000.

Schmidt, Adolf: *See—*
Roos, Ernst; Bartl, Herbert; Schuster, Klaus; and Schmidt, Adolf, 4,256,636, Cl. 260-192.000.

Schmidt, D. H.: *See—*
Froschauer, L. E.; Knape, R. U. B.; and Schmidt, D. H., 4,256,686, Cl. 264-209.000.

Schmidt, Gunther: *See—*
Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, 4,256,747, Cl. 424-250.000.

Schmidt, Hans-Dieter: *See—*
Petersen, Otto; and Schmidt, Hans-Dieter, 4,256,543, Cl. 204-1.00T.

Schmidt, Thomas: *See—*
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,256,740, Cl. 424-200.000.
Naumann, Klaus; Schubart, Rudiger; and Schmidt, Thomas, 4,256,907, Cl. 560-124.000.

Schmitt, Frederick L.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,256,121, Cl. 131-9.000.

Schneider, Heinz-Walter: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Weiss, Franz-Josef; and Lemann, Otto, 4,256,909, Cl. 560-204.000.

Schneider, Rudiger, to BBC Aktiengesellschaft Brown, Boveri & Cie. Circuit and process for automatically addressing a plurality of mobile substations from a central station. 4,257,032, Cl. 340-171.00A.

Schoen, Ernst: *See*—
Horacek, Heinrich; Schoen, Ernst; Reich, Erhardt; and Volkert, Otto, 4,256,841, Cl. 521-51.000.
Scholten, Dale A.; Schreiner, Frederick J.; Kenjesky, Raymond J.; and Bartlett, Kenneth E., to Lear Siegler, Inc. Warm air furnace. 4,256,082, Cl. 126-110.0AA.
Scholtissek, Georg: *See*—
Spaida, Hans-Peter; Scholtissek, Georg; and Teichmann, Manfred, 4,255,923, Cl. 56-364.000.
Schrader, Paul G.: *See*—
Martin, Patrick H.; Schrader, Paul G.; and Stringham, Robert R., 4,256,844, Cl. 521-59.000.
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., to Hesston Corporation. Bale-accumulating trailer. 4,255,985, Cl. 74-479.000.
Schreiner, Frederick J.: *See*—
Scholten, Dale A.; Schreiner, Frederick J.; Kenjesky, Raymond J.; and Bartlett, Kenneth E., 4,256,082, Cl. 126-110.0AA.
Schrewe, Hans: *See*—
von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, 4,256,165, Cl. 164-147.000.
Schroder, Dieter: *See*—
Quester, Karl W.; Haas, Johannes; Ulbrich, Hans-Joachim; and Schroder, Dieter, 4,255,869, Cl. 34-25.000.
Schroeder Brothers Corporation: *See*—
Barthe, Henry P.; and Cobb, William R., 4,256,186, Cl. 173-23.000.
Schromm, Kurt: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,256,756, Cl. 424-273.00R.
Schubart, Rudiger: *See*—
Naumann, Klaus; Schubart, Rudiger; and Schmidt, Thomas, 4,256,907, Cl. 560-124.000.
Schubert and Salzer: *See*—
Reisser, Gerd; and Lovas, Kurt, 4,256,272, Cl. 242-18.0PW.
Schulmeyer, Norbert: *See*—
von Bebenburg, Walter; Schulmeyer, Norbert; and Szelenyi, Istvan, 4,256,752, Cl. 424-263.000.
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, to Robert Bosch GmbH. Apparatus for detecting oscillations occurring during engine knock. 4,255,965, Cl. 73-35.000.
Schulze, Helmut; Zengel, Hans; Brodowski, Walter; Huntjens, Franciscus J.; Schutijser, Jan A. J.; and Hentschel, Peter, to Akzo N.V. Polyurethanes from trans-cyclohexane-1,4-diisocyanate. 4,256,869, Cl. 528-67.000.
Schurig, Helmut: *See*—
Mose, Luciano; Schurig, Helmut; and Strasser, Bernd, 4,256,562, Cl. 204-258.000.
Schuster, Ernst, to L. & C. Steinmuller GmbH. Method of generating gas and coke dust by rapid degasification and rapid vaporization. 4,256,539, Cl. 201-9.000.
Schuster, Klaus: *See*—
Roos, Ernst; Bartl, Herbert; Schuster, Klaus; and Schmidt, Adolf, 4,256,636, Cl. 260-192.000.
Schutijser, Jan A. J.: *See*—
Schulze, Helmut; Zengel, Hans; Brodowski, Walter; Huntjens, Franciscus J.; Schutijser, Jan A. J.; and Hentschel, Peter, 4,256,869, Cl. 528-67.000.
Schwab, Alfred: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,256,761, Cl. 424-282.000.
Schwabe, William E.; Elsner, Emil; and Kasper, Rudolph, to Korf-Stahl AG. Electrode for arc furnaces. 4,256,918, Cl. 13-11.000.
Schwander, Hansrudolf; and Zickendraht, Christian, to Ciba-Geigy Aktiengesellschaft. Naphtholactam dyestuffs. 4,256,896, Cl. 548-160.000.
Schwanz, Wilfried; and Seiffert, Ulrich, to Volkswagenwerk AG. Passive safety belt arrangement for vehicles. 4,256,331, Cl. 280-804.000.
Schwarting, Karl-Heinz; and Guenther, Roland, to Gutehoffnungshutte Sterkrade AG. Scraper chain conveyor with rack for the chainless feed of winning machines. 4,256,345, Cl. 299-43.000.
Schwartz, Harold O.; and Hoskinson, William R., to Wurlitzer Company, The. Large scale integrated circuit generator chip for electronic organ. 4,256,002, Cl. 84-1.010.
Schwartz, Sidney J., to Burroughs Corporation. Bubble nucleator. 4,257,109, Cl. 365-11.000.
Scientific Circuitry, Inc.: *See*—
Shepter, Joseph, 4,257,008, Cl. 328-206.000.
Scott, Charles E.; and Dewey, John L., to Reynolds Metals Company. Basic aluminum nitrate crystallization. 4,256,714, Cl. 423-295.000.
Scott, Donald, to Nuclear Power Company Limited. Liquid metal cooled fast breeder nuclear reactor. 4,256,538, Cl. 176-40.000.
Scott, John W.: *See*—
Batcho, Andrew D.; Hengartner, Urs O.; Leimgruber, Willy; Scott, John W.; and Valentine, Donald, Jr., 4,256,641, Cl. 260-326.14T.
Scouten, Charles G.: *See*—
Schlosberg, Richard H.; and Scouten, Charles G., 4,256,568, Cl. 208-263.000.
Scoville, Alfred M. Drainage pouch system. 4,256,110, Cl. 128-283.000.
SDS-Electro GmbH: *See*—
Sauer, Hans; Steinbichler, Wolf; Ritter, Heinz; and Antonitsch, Sepp, 4,257,081, Cl. 361-156.000.
Seach, Arden W. Cooking grill with lid. 4,256,080, Cl. 126-25.00R.
Seachman, Ned J.: *See*—
Kramer, Charles J., Jr.; and Seachman, Ned J., 4,257,016, Cl. 332-7.510.
Sealed Power Corporation: *See*—
Bush, Jerome J., 4,256,318, Cl. 277-221.000.
Searcy, Charles C. Automatic stove top fire extinguisher. 4,256,181, Cl. 169-65.000.
Sears, James T., to United States of America, Navy. Nonmagnetic compass. 4,255,866, Cl. 33-361.000.
Seidel, Charles. Adjustable workstop. 4,256,000, Cl. 83-468.000.
Seiderman, Maurice. Culinary mixer and disintegrator. 4,256,407, Cl. 366-300.000.
Seiffert, Ulrich: *See*—
Schwanz, Wilfried; and Seiffert, Ulrich, 4,256,331, Cl. 280-804.000.
Seiki Kabushiki Kaisha: *See*—
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, 4,256,047, Cl. 112-158.00E.
Seiler, Claus-Dieter: *See*—
Junger, Hans; and Seiler, Claus-Dieter, 4,256,623, Cl. 260-38.000.
Seiler, William, Jr.: *See*—
Kopf, J. David; Seiler, William, Jr.; Palecki, Gerald S.; and Kaufman, Howard H., 4,256,112, Cl. 128-303.00B.
Seipos, Andrew G., to Automated Building Components, Inc. Clip for securing planar members. 4,255,914, Cl. 52-483.000.
Seki, Norio: *See*—
Ota, Chuichi; Seki, Norio; and Sakaguchi, Haruo, 4,257,033, Cl. 340-870.160.
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, to Meiji Seika Kaisha, Ltd. Agricultural and horticultural pesticides. 4,256,744, Cl. 424-248.510.
Sekiya, Fukuo; and Maekawa, Yuzo, to Citizen Watch Co., Ltd. Electronic timepiece. 4,257,114, Cl. 368-62.000.
Sekiya, George W., to Mark Controls Corporation. Temperature monitor and alarm system. 4,256,258, Cl. 236-94.000.
Sekiya, Setsuro: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,256,063, Cl. 123-52.00M.
Sekizawa, Yashuharu: *See*—
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, 4,256,744, Cl. 424-248.510.
Seko, Nachio: *See*—
Fujimura, Itaru; Nakamura, Hitoshi; Kuroishi, Shoji; Seko, Nachio; and Ogawa, Toshiyuki, 4,256,401, Cl. 355-14.00E.
Sela, Ben-Ami: *See*—
Levin, Yehuda; and Sela, Ben-Ami, 4,256,632, Cl. 260-112.50R.
Selas Corporation of America: *See*—
Csapo, Michael A., 4,256,453, Cl. 432-235.000.
Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Masdea, Arturo; and Quagliarello, Giuseppe, 4,257,018, Cl. 333-17.00R.
Seligman, Robert B.; and Keritsis, Gus D., to Philip Morris Incorporated. Smokable material and its method of preparation. 4,256,126, Cl. 131-17.00A.
Sellards, Archibald B. Self-powered, cable-mounted trolleys and building rescue system. 4,256,199, Cl. 182-11.000.
Semionics Associates, Inc.: *See*—
Lamb, Sydney M.; and Smith, Randall C., 4,257,110, Cl. 365-49.000.
Semix Incorporated: *See*—
Lindmayer, Joseph, 4,256,681, Cl. 264-85.000.
Sentrol Systems Ltd.: *See*—
De Remigis, Joseph, 4,256,131, Cl. 137-3.000.
Senum, Gunnar I.: *See*—
Dietz, Russell N.; and Senum, Gunnar I., 4,256,038, Cl. 102-28.00R.
Sergeev, Jury A.: *See*—
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.
Sermon, Paul A., to Johnson, Matthey & Co., Limited. Catalysis. 4,256,711, Cl. 423-239.000.
Serres, Paul J. Gun-mounting apparatus. 4,256,245, Cl. 224-273.000.
Serruys, Max Y. A. M., to Agence Nationale de Valorisation de la Recherche (ANVAR). Carburettor. 4,256,066, Cl. 123-545.000.
Servo Corporation of America: *See*—
Sanville, W. Woodward, 4,256,278, Cl. 246-247.000.
Sexton, James H.: *See*—
Biszantz, Donald W.; Landers, Russell H.; Sexton, James H.; and Iammarino, Dominic J., 4,256,156, Cl. 145-33.00A.
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M. Counter-current gas-liquid contact apparatus. 4,256,674, Cl. 261-112.000.
Shanbhag, Sudhakar P.; and Szczesniak, Alina S., to General Foods Corporation. Fruit and cereal products and process therefor. 4,256,772, Cl. 426-331.000.
Sharp, Bernard C., to Parker-Hannifin Corporation. Remote controllable motorized rear view mirror. 4,256,375, Cl. 350-289.000.
Sharp Kabushiki Kaisha: *See*—
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, 4,256,047, Cl. 112-158.00E.
Tsujimoto, Susumu; Yamazaki, Hayao; Ozaki, Masayoshi; and Kobayashi, Takehiro, 4,256,127, Cl. 132-9.000.
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., to Massachusetts Institute of Technology. Orientation of ordered liquids and their use in devices. 4,256,787, Cl. 428-1.000.

Shaw, Howard A.; and Todhunter, John D., to Brewer, Gordon A.; and Buell, Eugene F. Flexible mobile conveyor. 4,256,213, Cl. 198-303.000.

Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company. Production of ethylenically unsaturated aliphatic acids. 4,256,915, Cl. 562-535.000.

Shea, Daniel. Automotive clutch alignment tool. 4,255,839, Cl. 29-274.000.

Shelton, Thomas F., to International Business Machines Corporation. Dot matrix print head. 4,256,408, Cl. 400-124.000.

Shen, Tsung-Ying: *See—*
Durette, Philippe L.; and Shen, Tsung-Ying, 4,256,735, Cl. 424-177.000.

Shepard, Kenneth L.; and Brenner, Daniel G., to Merck & Co., Inc. Process for the preparation of imino-bridged benzocycloheptapyridines. 4,256,889, Cl. 546-63.000.

Shepperd, Michael E.: *See—*
Henderson, Claude L.; and Shepperd, Michael E., 4,257,121, Cl. 455-89.000.

Shepter, Joseph, to Scientific Circuitry, Inc. Logic circuit building block and systems constructed from same. 4,257,008, Cl. 328-206.000.

Sherex Chemical Company, Inc.: *See—*
Egan, Richard R.; and Cotrell, Phillip L., 4,256,611, Cl. 252-548.000.

Sherif, Hassan A.: *See—*
Ayres, Rand K.; and Sherif, Hassan A., 4,256,920, Cl. 174-65.00R.

Sherwood Medical Industries Inc.: *See—*
Finley, Michael J., 4,256,120, Cl. 128-764.000.

Shibata, Fujio, to TDK Electronics Co., Ltd. Read device for plane magnetic recording medium. 4,257,078, Cl. 360-130.340.

Shibata, Toshiroh: *See—*
Kitayama, Shoji; Okamitsu, Hiroaki; Nakatani, Motohiko; and Shibata, Toshiroh, 4,256,428, Cl. 414-121.000.

Shields, Walter. Apparatus for arranging and transporting articles. 4,256,215, Cl. 198-407.000.

Shillander, Harold E., to International Oil Tools, Inc. Indexing tool for use in earth borehole drilling and testing. 4,256,179, Cl. 166-237.000.

Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho. Torsional vibration monitoring apparatus for a rotating shaft system. 4,255,978, Cl. 73-577.000.

Shima, Seiya: *See—*
Ando, Takeki; Shima, Seiya; Kurosawa, Toshiaki; Inaba, Hiromi; Kuroha, Hiroaki; Miyao, Hideo; Sakai, Yoshio; and Issiki, Katuhito, 4,256,204, Cl. 187-29.00R.

Shimazaki, Tadatoshi: *See—*
Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, 4,256,503, Cl. 106-100.000.

Shimazaki, Toshikazu: *See—*
Futaba, Kunihiko; Shimazaki, Toshikazu; Osagawa, Atsumi; and Hiraoka, Akira, 4,257,118, Cl. 368-276.000.
Hatuse, Toshikazu; Natori, Minoru; Shimazaki, Toshikazu; Kawanobe, Kouhei; and Ogawa, Hiroshi, 4,257,115, Cl. 368-69.000.

Shimizu, Yukihiko; and Ozawa, Kazunori, to Sony Corporation. Grooved drum for tape recording and/or reproducing apparatus. 4,257,076, Cl. 360-130.240.

Shimoda Electric Company: *See—*
Yasuhisa, Saburo, 4,257,027, Cl. 336-192.000.

Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, to Chiyoda Chemical Engineering and Construction Co., Ltd. Process for biological treatment of waste water in downflow operation. 4,256,573, Cl. 210-618.000.

Shimokai, Katzujiro; Kataoka, Masayuki; and Funamoto, Akihiko, to Nippon Soda Company, Ltd. Paint composition for cathodic electrodeposition. 4,256,621, Cl. 260-29.7NR.

Shimoma, Taketoshi; Fukuda, Kumio; and Nakamura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Color picture tube apparatus. 4,257,024, Cl. 335-213.000.

Shimosakoda, Akio: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.

Shindo, Isamu: *See—*
Kimura, Shigeyuki; Shindo, Isamu; Mori, Yasumichi; Kitamura, Kenji; and Ii, Nobuo, 4,256,531, Cl. 156-620.000.

Shioi, Keiko: *See—*
Yamamoto, Masaji; Shioi, Keiko; and Murakami, Kimio, 4,256,494, Cl. 106-22.000.

Shiokawa, Takayasu: *See—*
Yokoi, Hiroshi; and Shiokawa, Takayasu, 4,257,048, Cl. 343-709.000.

Shiomi, Yasushi: *See—*
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, 4,256,908, Cl. 560-204.000.

Shionogi & Co., Ltd.: *See—*
Kawamura, Yoshimi; Shoji, Jun'ichi; and Matsumoto, Kouichi, 4,256,835, Cl. 435-48.000.
Makisumi, Yasuo; Takada, Susumu; Sasatani, Takashi; and Ishizuka, Natsuki, 4,256,640, Cl. 260-326.12A.
Makisumi, Yasuo; Murabayashi, Akira; Takase, Akira; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,256,899, Cl. 548-246.000.

Shirahama, Haruhisa: *See—*
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,256,766, Cl. 424-319.000.

Shirakawa, Kinichi: *See—*
Itoga, Kiyoshi; Ogino, Fumiichi; Shirakawa, Kinichi; and Soga, Yasuyuki, 4,256,773, Cl. 426-415.000.

Shirasaki, Shinji; Ohta, Katsuhiro; and Sugisaki, Takao, to Nippondenso Co., Ltd.; and TDK Electronics Co., Ltd. Engine rotational information detecting apparatus. 4,257,040, Cl. 340-671.000.

Shirayama, Kenzo: *See—*
Ito, Masayuki; Okamoto, Giro; Machi, Sueo; and Shirayama, Kenzo, 4,256,856, Cl. 525-331.000.

Shmorgunenko, Nikolai S.: *See—*
Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M., 4,256,709, Cl. 423-119.000.

Shnikov, Ivan K.: *See—*
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Shoji, Jun'ichi: *See—*
Kawamura, Yoshimi; Shoji, Jun'ichi; and Matsumoto, Kouichi, 4,256,835, Cl. 435-48.000.

Shoji, Takashi; and Utaka, Tadashi, to Rigaku Industrial Corporation. X-ray spectroscope. 4,256,961, Cl. 250-272.000.

Shoor, Bernard A., to Becton, Dickinson and Company. Resealable device. 4,256,106, Cl. 128-247.000.

Shum, Ying K., to National Semiconductor Corporation. Electrically erasable read only memory. 4,257,056, Cl. 357-23.000.

Sibata, Masaharu: *See—*
Kubo, Masaaki; Onodera, Yasutaka; Kawaguchi, Hiroshi; and Sibata, Masaharu, 4,256,342, Cl. 299-7.000.

Siemens Aktiengesellschaft: *See—*
Beck, Kurt, deceased; Beck, Christa, heir; Beck, by Thomas, heir; Beck, Matthias, heir; and Marsing, Helmut, 4,255,849, Cl. 29-599.000.
Krueger, Hans; and Pink, Hans, 4,256,377, Cl. 350-340.000.
Petrak, Heinz; Vieweg, Gunther; and Weinicke, Martin, 4,256,352, Cl. 308-10.000.

Siemens Medical Laboratories, Inc.: *See—*
Heinz, Lothar R., 4,256,966, Cl. 250-491.000.

Sigg, Hans, to Maag Gear-Wheel & Machine Company, Limited. Marine reversing gearing. 4,255,981, Cl. 74-665.00A.

Sigman, John J. Nail polish dryer. 4,255,871, Cl. 34-243.00R.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-4-oxo-PGI compounds. 4,256,648, Cl. 260-346.220.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-6a-carba-PGI_2 amides. 4,256,663, Cl. 564-188.000.

Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19-hydroxy-19-methyl-6a-carba-PGI_2 compounds. 4,256,667, Cl. 564-384.000.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-6a-carba-PGI_2 compounds. 4,256,905, Cl. 560-119.000.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-trans-2,3-didehydro-PG_1 compounds. 4,256,906, Cl. 560-121.000.

SIHI GmbH & Co. KG: *See—*
Fandrey, Peter; and Muller, Hermann, 4,256,436, Cl. 415-143.000.

Sikdar, Subhas K., to Occidental Research Corporation. Process for treating loaded extractant from purification of phosphoric acid by extraction. 4,256,716, Cl. 423-321.00S.

Silag, Inc.: *See—*
Somasundaran, Ponisseril; and Ananthapadmanabhan, Kavssery P., 4,256,571, Cl. 209-5.000.

Silverman, Jacob: *See—*
Friedman, Joseph; Hines, William S.; Raniere, Frederick D.; and Silverman, Jacob, 4,256,565, Cl. 208-129.000.

Simmonds Precision Products, Inc.: *See—*
Powell, Frederic D., 4,256,403, Cl. 356-73.000.

Simmons, Bobby G.: *See—*
Atchison, Hugh C.; and Simmons, Bobby G., 4,256,511, Cl. 134-46.000.

Simmons, Perley F.: *See—*
Fisher, Gary J.; Morean, James E.; Simmons, Perley F.; and Van-Gorden, Steven N., 4,256,390, Cl. 354-1.000.

Simon, Jean-Luc: *See—*
Freer, William G.; and Simon, Jean-Luc, 4,255,848, Cl. 29-592.00R.

Simon, Warren J.: *See—*
Weaver, William D.; and Simon, Warren J., 4,256,777, Cl. 426-637.000.

Simonov, Sergei M.: *See—*
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.

Simons, Michael J.; Southby, David T.; and Ling, Hans G., to Eastman Kodak Company. Blocked benzotriazole compounds as development restrainer precursors. 4,256,881, Cl. 544-132.000.

Simpson, Thomas E.: *See—*
Goda, Boyd D.; Simpson, Thomas E.; St. Vincent, Craig J.; and Collura, Peter C., 4,256,025, Cl. 493-160.000.

Sinclair, Michael J.: *See—*
Heymsfield, Steven B.; and Sinclair, Michael J., 4,257,107, Cl. 364-560.000.

Sineva, Kapitolina N.: *See—*
Gorlovsky, David M.: Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.

Singer Company, The: *See—*
DeCarlo, Frank S.; Rosen, Frank L.; and Goetz, Walter J., 4,255,979, Cl. 74-5.470.
Ljung, Bo H. G., 4,257,015, Cl. 331-94.50D.
Theall, Charles E., Jr., 4,257,125, Cl. 455-608.000.
Theall, Charles E., Jr., 4,257,126, Cl. 455-619.000.

Sironi, Giuseppe, to Vibram S.p.A. Lug sole for footwear. 4,255,874, Cl. 36-32.00R.

Siwerstam, Jan, to United States Tobacco Company. Method and machine for producing pipe cleaners. 4,255,924, Cl. 57-24.000.

Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M. Method for the production of alumina. 4,256,709, Cl. 423-119.000.

Skawa, Kazuo, to Canon Kabushiki Kaisha. Actuating circuit for light measuring circuit in electronic flash device. 4,256,994, Cl. 315-151.000.

Skiles, Jerry W.: *See—*
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,256,761, Cl. 424-282.000.

Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, to Schering Aktiengesellschaft. New prostane derivatives and process for their preparation. 4,256,745, Cl. 424-248.550.

SL Container Corporation: *See—*
Dunchock, Richard S., 4,256,340, Cl. 296-24.00R.

Slack, Keith K.: *See—*
McCullough, J. Warren; Poland, Terrell A.; Reynolds, Dale N.; Slack, Keith K.; and Turner, Richard T., 4,257,096, Cl. 364-200.000.

Slade, Boyd E.: *See—*
Wolf, Peter H.; and Slade, Boyd E., 4,256,948, Cl. 219-121.0LE.

Slater, William L.: *See—*
Schlinger, Warren C.; and Slater, William L., 4,256,654, Cl. 260-449.60R.

Slavin, Michael; and Telmet, Juhan, to Lectron Products, Inc. Tone generator. 4,257,036, Cl. 340-388.000.

Slotvinsky-Sidak, Nikolai P.: *See—*
Bobkova, Olga S.; Slotvinsky-Sidak, Nikolai P.; Travin, Oleg V.; and Frolov, Averky A., 4,256,487, Cl. 75-134.00V.

Smadja, Rene. Method for making road surface coatings. 4,256,734, Cl. 427-139.000.

Smilanich, Nicholas J.; and Reichert, Samuel F., to Union Carbide Corporation. Seals for electrochemical cells. 4,256,815, Cl. 429-185.000.

Smit Ovens Nijmegen BV: *See—*
Wiersma, Tjeerd G., 4,256,454, Cl. 432-241.000.

Smith, Bert A. Trolling planer and release. 4,255,890, Cl. 43-43.120.

Smith, Dewey H., Jr., to Du Pont de Nemours, E. I., and Company. Method of using N-substituted dihydro-2-oxazolamines as analgesics. 4,256,755, Cl. 424-272.000.

Smith, George H., to Minnesota Mining and Manufacturing Company. Photocopolymerizable compositions based on epoxy and hydroxyl-containing organic materials. 4,256,828, Cl. 430-280.000.

Smith, Harry A., to Dow Chemical Company, The. Curable hydroxy resin compositions. 4,256,622, Cl. 260-33.20R.

Smith, Henry I.: *See—*
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., 4,256,787, Cl. 428-1.000.

Smith International, Inc.: *See—*
Bolton, Jimmie B.; and Crews, Sam T., 4,256,518, Cl. 148-127.000.

Smith, Jack E.; Roberts, David E.; and Jalbing, John I., to General Motors Corporation. Catalytic converter with air tube. 4,256,700, Cl. 422-177.000.

Smith, James B.; and Whitney, Craig B., to Pneumafil Corporation. Pneumatic valve control for textile machinery blowdown. 4,256,130, Cl. 137-1.000.

Smith, Lawrence M.: *See—*
Moshofsky, Jerome F., 4,256,251, Cl. 227-120.000.

Smith, Randall B.: *See—*
Triplett, John W.; and Smith, Randall B., 4,256,727, Cl. 424-1.500.

Smith, Randall C.: *See—*
Lamb, Sydney M.; and Smith, Randall C., 4,257,110, Cl. 365-49.000.

Smith, Tommy L.; Dierickx, Edward G.; Schade, Walter B., Jr.; and Pete, Leslie A., to Athletic Training Equipment Company. Baseball. 4,256,304, Cl. 273-60.00B.

Smyly, Harold M.: *See—*
Helms, Curtis R.; and Smyly, Harold M., 4,256,093, Cl. 128-1.00R.

Snediker, David K.: *See—*
Dufrane, Keith F.; and Snediker, David K., 4,255,974, Cl. 73-776.000.

Snedkerud, Ole, to Patelhold Patentverwertungs- & Elektro-Holding AG. Apparatus for improving the efficiency of the modulation stage of a transmitter. 4,257,122, Cl. 455-91.000.

Snider, David M., to General Electric Company. Instrument and method for calibrating nuclear cameras. 4,256,960, Cl. 250-252.000.

Snyder, Ritchie A., to W. L. Gore & Associates, Inc. Smudge free graphite coated polymeric substrate and a method for preparing the same. 4,256,806, Cl. 428-378.000.

Sobata, Tamotsu; and Nakatani, Nobuo, to Nippon Paint Co., Ltd. Degreasing composition for treating metal surface. 4,256,601, Cl. 252-135.000.

Soboroff, David M.; and McDonald, Hector O., to United States of America, Interior. Copper electrowinning and Cr^{+6} reduction in spent etchants using porous fixed bed coke electrodes. 4,256,557, Cl. 204-149.000.

Societe Anonyme de Telecommunications: *See—*
Deschamps, Rene G., 4,257,022, Cl. 333-201.000.

Societe Anonyme dite: CGEE Alsthom: *See—*
Debaigt, Jean, 4,256,360, Cl. 339-97.00R.

Societe Anonyme dite Stratiforme: *See—*
Savey, Claude; and Laurent, Florent, 4,256,803, Cl. 428-315.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Winters, Thomas B.; and Friday, Jim H., 4,256,216, Cl. 198-488.000.

Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,256,767, Cl. 424-324.000.

Societe Francaise pour le Developpement de l'Automatisme en Biologie: *See—*
Lamaziere, Jacques, 4,256,153, Cl. 141-84.000.

Soderstrom, Gert. Manhold. 4,255,909, Cl. 52-20.000.

Soga, Yasuyuki: *See—*
Itoga, Kiyoshi; Ogino, Fumiichi; Shirakawa, Kinichi; and Soga, Yasuyuki, 4,256,773, Cl. 426-415.000.

Sokol, Larry S.; McComas, Charles C.; and Hanna, Earl M., to United Technologies Corporation. Plasma spray method and apparatus. 4,256,779, Cl. 427-34.000.

Solomons, Gerald L.; and LeGrys, Geoffrey A., to Reaks Hovis McDougall Limited. Reactor system such as a fermentation system. 4,256,839, Cl. 435-314.000.

Solvay & Cie: *See—*
Tytgat, Daniel; Degols, Albert; and Dujardin, Francois, 4,256,542, Cl. 204-1.00T.

Somasundaran, Ponisseril; and Ananthapadmanabhan, Kavssery P., to Silag, Inc. Recovery of silicon carbide whiskers from coked, converted rice hulls by selective flocculation-liquid extraction. 4,256,571, Cl. 209-5.000.

Somerville, Robert L. Agitator and driving means therefor. 4,256,406, Cl. 366-279.000.

Someshwar, Ashok H., to Texas Instruments Incorporated. Fast binary coded decimal incrementing circuit. 4,256,954, Cl. 235-92.0SH.

Someya, Atsushi, to Canon Kabushiki Kaisha. Zoom lens with extended variable focal length range. 4,256,371, Cl. 350-423.000.

Sommer, Rudiger; and Wischer, Hermann, to Dr.-Ing. Rudolf Hell GmbH, Firma. Method for converting a video signal into a black/-white signal. 4,257,070, Cl. 358-282.000.

Sony Corporation: *See—*
Kaneko, Yoshiro; and Sato, Masaru, 4,257,066, Cl. 358-183.000.
Shimizu, Yukihiko; and Ozawa, Kazunori, 4,257,076, Cl. 360-130.240.
Tatami, Mitsushige, 4,257,073, Cl. 360-10.000.

Soodak, Charles, to Baxter Travenol Laboratories, Inc. Cuvette rotor assembly. 4,256,696, Cl. 422-72.000.

Soohoo, Jack E.; McNutt, Michael J.; Yao, Shi-Kay; Hayes, Cecil L.; and Gudmundsen, Richard A., to Rockwell International Corporation. Digital-to-analog optical recorder. 4,257,111, Cl. 365-114.000.

Sou, Teho. Portable case for carrying small animal. 4,256,056, Cl. 119-19.000.

Southby, David T.: *See—*
Simons, Michael J.; Southby, David T.; and Ling, Hans G., 4,256,881, Cl. 544-132.000.

Sowers, Charles. Swimming pool solar heater. 4,256,087, Cl. 126-415.000.

Spaida, Hans-Peter; Scholtissek, Georg; and Teichmann, Manfred, to VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen. Pickup for stalk-crop harvester. 4,255,923, Cl. 56-364.000.

Spector, George: *See—*
Schlueter, Roy; and Spector, George, 4,256,308, Cl. 273-177.00A.

Spector, Richard J., to Mooney Chemicals, Inc. Rigid polyurethane foam process using lithium/zinc catalyst. 4,256,847, Cl. 521-117.000.

Spencer Turbine Company, The: *See—*
De Martino, Dominick, 4,256,473, Cl. 55-379.000.

Spin Physics, Inc.: *See—*
Brooks, Steven W.; and Favrou, John M., 4,256,996, Cl. 318-7.000.

Spindler, Thomas C.: *See—*
Hendrickson, Thomas E.; and Spindler, Thomas C., 4,256,979, Cl. 307-571.000.

SPOFA, spojene podniky pro zdravotnichou: *See—*
Wichterle, Otto, 4,256,369, Cl. 350-160.00H.

Sprague Electric Company: *See—*
Miles, Steven W.; and Emerald, Paul R., 4,256,515, Cl. 148-1.500.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Use of 2-oxabicyclooctane derivatives in augmenting or enhancing the aroma or taste of smoking tobacco and smoking tobacco articles. 4,256,121, Cl. 131-9.000.

Square D Company: *See—*
Woodlief, Frederick E.; and DeAmicis, Gene E., 4,256,937, Cl. 200-144.00R.

Squibb, John W. Reverse-dish tiller blades. 4,256,184, Cl. 172-531.000.

Staar S.A.: *See—*
Schatteman, Etienne A. M., 4,256,274, Cl. 242-201.000.

Stach, Leonard J., to Velsicol Chemical Corporation. Pyridyl esters of N-alkylidene-substituted phosphor- and phosphonamidic acids. 4,256,741, Cl. 424-200.000.

Stalcup, Robert K.: *See—*
Prewo, Karl M.; and Stalcup, Robert K., 4,256,378, Cl. 350-310.000.
Stamicarbon, B.V.: *See—*
Goorden, Josephus J. P. M., 4,256,471, Cl. 55-70.000.
Stamper, Richard W.; and Rhonehouse, Richard L., to Inmont Corporation. Contoured resilient vehicle trim panel. 4,256,797, Cl. 428-215.000.
Standard Oil Company: *See—*
Lautzenhiser, Theodore V., 4,255,969, Cl. 73-382.00G.
Shaw, Wilfrid G.; and Terrill, David B., 4,256,915, Cl. 562-535.000.
Standard Oil Company (Indiana): *See—*
Karayannis, Nicholas M.; and Lee, Sam S., 4,256,866, Cl. 526-142.000.
Ott, Louis E., 4,256,691, Cl. 422-7.000.
Stangl, Wilfried, to Aerotrans Rohrpostanlagen Gesellschaft m.b.H. Rohrpoststation (pneumatic-tube station). 4,256,418, Cl. 406-112.000.
Stanislaw, Peter P., to Morrison Machine Company. Apparatus for stretching an endless web. 4,256,537, Cl. 162-273.000.
Staudacher, Frank: *See—*
Stemme, Otto; and Staudacher, Frank, 4,256,392, Cl. 354-86.000.
Stead, Eugene A., Jr.: *See—*
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P., 4,256,098, Cl. 128-133.000.
STEAG Aktiengesellschaft: *See—*
Heyn, Klaus; and Pogrzeba, Hans J., 4,255,926, Cl. 60-39.120.
Steffen, Sylvester L.; and Steffen, Vincent B. Pressure reducing exhaust method and structure for ventilated grain bins. 4,256,029, Cl. 98-55.000.
Steffen, Vincent B.: *See—*
Steffen, Sylvester L.; and Steffen, Vincent B., 4,256,029, Cl. 98-55.000.
Stehman, Carl J.: *See—*
Pitroda, Satyan G.; Fechalos, William A.; and Stehman, Carl J., 4,256,926, Cl. 179-18.0ES.
Steinbichler, Wolf: *See—*
Sauer, Hans; Steinbichler, Wolf; Ritter, Heinz; and Antonitsch, Sepp, 4,257,081, Cl. 361-156.000.
Steiner, Edwin C.; and Vrieland, G. Edwin, to Dow Chemical Company, The. Process for displacing nuclear iodine with chlorine in iodipyridines. 4,256,895, Cl. 546-345.000.
Stellar Systems, Inc.: *See—*
Mongeon, Ronald W., 4,257,037, Cl. 340-533.000.
Stemme, Otto; and Staudacher, Frank, to AGFA-Gevaert, A.G. Self-developing camera. 4,256,392, Cl. 354-86.000.
Stenberg, Sven-Eric. Window device. 4,255,901, Cl. 49-402.000.
Stephen, Keith H.: *See—*
Popp, Gerhard; Saturno, Patrick H.; and Stephen, Keith H., 4,256,826, Cl. 430-213.000.
Stephenson, Roger B., to Bender, John T., Jr., a part interest. Closed loop power system. 4,255,934, Cl. 60-655.000.
Sterling Drug Inc.: *See—*
Bhargava, Pankaj, 4,256,574, Cl. 210-614.000.
Stern, Harold J.: *See—*
Day, Ian H.; Baldwin, William A.; and Stern, Harold J., 4,256,795, Cl. 428-196.000.
Stevens, Carlile R. Traffic control system. 4,257,029, Cl. 340-40.000.
Stevenson, David R., to Rolls-Royce Limited. Method of brazing with replaced braze powder. 4,256,255, Cl. 228-175.000.
Stewart, Charles M.; and Killebrew, Wilbur N., Jr., to Phillips Petroleum Company. Control of a cracking furnace. 4,257,105, Cl. 364-501.000.
Stewart Naumann Laboratories, Inc.: *See—*
Brown, Fon R., 4,256,437, Cl. 417-45.000.
Stitt, Thomas D.: *See—*
Griffith, Robert J.; and Stitt, Thomas D., 4,256,983, Cl. 307-271.000.
Stiver, J. Harold: *See—*
Roggow, Mervin A.; and Stiver, J. Harold, 4,256,059, Cl. 122-32.000.
Stockhausen, Dolf; and Peppmoller, Reinmar, to Chemische Fabrik Stockhausen & Cie. Antistatic agents for coating the backing of carpets and other flat textile articles. 4,256,800, Cl. 428-245.000.
Stockinger, Friedrich: *See—*
Eldin, Sameer H.; and Stockinger, Friedrich, 4,256,867, Cl. 526-263.000.
Stodt, Eberhard; and Kaldenbach, Erwin, to Lindemann Maschinenfabrik GmbH. Method of loading bales on to transport. 4,256,434, Cl. 414-786.000.
Stone, Frederick L.: *See—*
Swaroop, Nareshwar; and Stone, Frederick L., 4,256,140, Cl. 137-561.00A.
Stone, Orison W., to Pack Image, Inc. Bottle container and method of erecting and loading the same. 4,256,226, Cl. 206-427.000.
Stone, Walter N. String packaging machine and apparatus. 4,255,917, Cl. 53-430.000.
Stoneburner, Leonard G., to Mead Corporation, The. Molded orifice plate assembly for an ink jet recorder and method of manufacture. 4,257,052, Cl. 346-75.000.
Storck, Glenn E., to Thomas & Betts Corporation. Termination connector. 4,256,359, Cl. 339-97.00C.
Stork-Brabant B.V.: *See—*
Vertegaal, Jacobus G., 4,256,037, Cl. 101-115.000.
Stover, Michael L. Air circulation and humidification system for stoves. 4,256,081, Cl. 126-101.000.
Strasser, Bernd: *See—*
Mose, Luciano; Schurig, Helmut; and Strasser, Bernd, 4,256,562, Cl. 204-258.000.
Strauss, Werner; and Lenzer, Xaver, to Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co. Self-driven forage harvester. 4,256,431, Cl. 414-505.000.
Streetman, Ben G.: *See—*
Hess, Karl; Streetman, Ben G.; and Morkoc, Hadis, 4,257,055, Cl. 357-16.000.
Streit, James L. Percussion instrument carrier. 4,256,007, Cl. 84-421.000.
Streller, Bernd; and Lehmann, Heinz, to Veb Elektronische Erzeugnisse Barenstein. Photographic shutter. 4,256,397, Cl. 354-250.000.
Strickland, Benjamin W. Solar furnace support apparatus. 4,256,175, Cl. 165-67.000.
Strien, Werner: *See—*
Goldner, Walter; and Strien, Werner, 4,256,341, Cl. 297-410.000.
Stringham, Robert R.: *See—*
Martin, Patrick H.; Schrader, Paul G.; and Stringham, Robert R., 4,256,844, Cl. 521-59.000.
Strobel, Manfred; and Thiersch, Friedrich, to Carl Still, Firma. Regenerative heating system for horizontal coke oven batteries. 4,256,540, Cl. 202-139.000.
Strobel, Rudolf G. K.; and Eich, Richard A., to Procter & Gamble Company, The. Decaffeination process. 4,256,774, Cl. 426-428.000.
Strohband, Rolf, to Guschky & Tonnesmann GmbH & Co. KG. Spiral labelling. 4,256,027, Cl. 493-11.000.
Strong, Thomas J. Method and apparatus for precision locating of a workpiece in a press brake. 4,255,958, Cl. 72-389.000.
Strunc, Gerald R., to Pako Corporation. Photographic print sorter with sensor to detect presence of prints in conveyor lines. 4,255,994, Cl. 83-79.000.
Stubbings, James H., to Potomac Applied Mechanics, Inc. Angle iron cutting. 4,255,993, Cl. 83-71.000.
Studsvik Energiteknik AB: *See—*
Roy, Ram B.; Ostehsson, Lars B.; and Westin, Rolf B., 4,256,808, Cl. 428-421.000.
Styman, Alan F.: *See—*
Hickman, Ronald P.; and Styman, Alan F., 4,256,294, Cl. 269-16.000.
Sugasawa, Fukashi; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Control system for closed loop mixture correction and split engine operation. 4,256,074, Cl. 123-440.000.
Sugimoto Chemical Co. Ltd.: *See—*
Ito, Masayuki; Okamoto, Giro; Machi, Sueo; and Shirayama, Kenzo, 4,256,856, Cl. 525-331.000.
Sugisaki, Takao: *See—*
Shirasaki, Shinji; Ohta, Katsuhiro; and Sugisaki, Takao, 4,257,040, Cl. 340-671.000.
Sugiyama, Shiro, to Kubota, Ltd. Construction of circuit for working vehicle operable as backhoe and also as dozer. 4,256,432, Cl. 414-694.000.
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, to USV Pharmaceutical Corporation. Antihypertensive amides. 4,256,761, Cl. 424-282.000.
Sullivan, Leo S., Jr.; and DeVincent, Patsy, to General Motors Corporation. Jounce bumper for suspensions. 4,256,292, Cl. 267-8.00R.
Sulphur Development Institute of Canada: *See—*
Terrel, Ronald L., 4,256,499, Cl. 106-70.000.
Sumida, Seizo: *See—*
Asao, Shuichiro; Nakayama, Yoshinori; Yoshida, Ryo; Sumida, Seizo; and Hashimoto, Shunichi, 4,256,483, Cl. 71-92.000.
Sumimoto, Shinzaburo: *See—*
Makisumi, Yasuo; Murabayashi, Akira; Takase, Akira; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,256,899, Cl. 548-246.000.
Sumitomo Chemical Company, Limited: *See—*
Asao, Shuichiro; Nakayama, Yoshinori; Yoshida, Ryo; Sumida, Seizo; and Hashimoto, Shunichi, 4,256,483, Cl. 71-92.000.
Sumitomo Metal Industries Limited: *See—*
Kitayama, Shoji; Okamitsu, Hiroaki; Nakatani, Motohiko; and Shibata, Toshiroh, 4,256,428, Cl. 414-121.000.
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of a multicylinder internal combustion engine. 4,256,063, Cl. 123-52.00M.
Sung, Rodney L.; and Zoleski, Benjamin H., to Texaco Inc. Diesel lubricant composition containing 5-amino-triazole-succinic anhydride reaction product. 4,256,595, Cl. 252-51.50A.
Suter, Alois, to Suter, Alois. Plant for injection molding of thermosetting epoxy plastics. 4,256,444, Cl. 425-73.000.
Suurkuust, Jaak: *See—*
Biltonen, Rodney L.; Mountcastle, Donald B.; and Suurkuust, Jaak, 4,255,961, Cl. 73-15.00B.
Suwa, Hiroaki: *See—*
Nakata, Kiyohiro; and Suwa, Hiroaki, 4,255,861, Cl. 33-166.000.
Suzue, Masayoshi: *See—*
Kinoshita, Tsukuru; Ogata, Yuzuru; and Suzue, Masayoshi, 4,256,715, Cl. 423-300.000.
Suzuki, Akira: *See—*
Ohashi, Takashi; Okuyama, Toru; and Suzuki, Akira, 4,256,799, Cl. 428-215.000.
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, to Sharp Kabushiki Kaisha; and Seiki Kabushiki Kaisha. Error indication arrangement for use in a sewing machine. 4,256,047, Cl. 112-158.00E.

Suzuki, Kenichi: *See*—
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, 4,256,914, Cl. 562-535.000.

Suzuki, Nobuo, to Katoh Electric Machinery Co., Ltd. Lead-in system for record player. 4,256,310, Cl. 369-217.000.

Suzuki, Sadao; Akutsu, Masao; and Ota, Akiho, to Yoshino Kogyosho Co., Ltd. Injection molded, polyethylene terephthalate parison for blow molding. 4,256,789, Cl. 428-35.000.

Suzuki, Yoshiaki: *See*—
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, 4,256,817, Cl. 430-17.000.

Suzuki, Yukio: *See*—
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, 4,256,744, Cl. 424-248.510.

Suzuki, Yukitomo; and Honda, Masakazu, to Heian Iron Works, Ltd. Apparatus for controlling position of a plurality of machining shafts each including a machine tool fitted thereto. 4,257,103, Cl. 364-474.000.

Svenska Traforskningsinstitutet: *See*—
Malmquist, Lars, 4,255,870, Cl. 34-35.000.

Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P. Safety restraint system for ambulatory patients. 4,256,098, Cl. 128-133.000.

Swaroop, Nareshwar; and Stone, Frederick L., to Continental Group, Inc., The. Two-piece hot runner manifold. 4,256,140, Cl. 137-561.00A.

Sweeney, Charles T. Chlorine generator. 4,256,552, Cl. 204-98.000.

Swigert, J. Kirk: *See*—
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, 4,256,818, Cl. 430-39.000.

Swiss Aluminium Ltd.: *See*—
Livak, Ronald J., 4,256,488, Cl. 75-142.000.

Syntex (U.S.A.) Inc.: *See*—
Nestor, John J.; and Vickery, Brian H., 4,256,737, Cl. 424-177.000.

Synthelabo: *See*—
Gabriel, Jean P.; Dumont, Marcel; and Guille, Robert, 4,256,875, Cl. 536-4.000.

Synthetic Surfaces, Inc.: *See*—
Legue, Norris R., 4,256,615, Cl. 260-18.0TN.

Sypula, Donald S.: *See*—
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, 4,256,818, Cl. 430-39.000.

Syrbe, Max; and Heger, Dirk, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Electronic data processing system for real time data processing. 4,257,100, Cl. 364-200.000.

Syva Company: *See*—
Zuk, Robert F.; and Ullman, Edwin F., 4,256,834, Cl. 435-7.000.

Szczesniak, Alina S.: *See*—
Shanbhag, Sudhakar P.; and Szczesniak, Alina S., 4,256,772, Cl. 426-331.000.

Szelenyi, Istvan: *See*—
von Bebenburg, Walter; Schulmeyer, Norbert; and Szelenyi, Istvan, 4,256,752, Cl. 424-263.000.

T I Fords Limited: *See*—
Ford, Geoffrey E.; and Pantelides, Antis N., 4,256,957, Cl. 250-223.00B.

Taihei Chemicals Ltd.: *See*—
Matsumoto, Kenji; Hishikawa, Shintaro; and Ito, Yoshikatsu, 4,256,492, Cl. 106-22.000.

Takada, Juichiro. Passive vehicle passenger restraint system. 4,256,332, Cl. 280-804.000.

Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, to Nippon Skokubei Kagaku Kogyo Co., Ltd. Catalytic vapor phase oxidation reactor apparatus. 4,256,783, Cl. 422-197.000.

Takada, Susumu: *See*—
Makisumi, Yasuo; Takada, Susumu; Sasatani, Takashi; and Ishizuka, Natsuki, 4,256,640, Cl. 260-326.12A.

Takagi, Hiroshi: *See*—
Horiba, Isao; Kuwabara, Yasuo; Takagi, Hiroshi; and Satou, Shigeru, 4,257,102, Cl. 364-414.000.

Takahashi, Jiro: *See*—
Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, 4,256,831, Cl. 430-562.000.

Takahashi, Sadao; and Katoh, Yoshiaki, to Hitachi, Ltd. Mass spectrometer. 4,256,963, Cl. 250-296.000.

Takahashi, Teruomi; and Matsuo, Takehiko, to Canon Kabushiki Kaisha. Electrophotographic photosensitive media. 4,256,823, Cl. 430-66.000.

Takase, Akira: *See*—
Makisumi, Yasuo; Murabayashi, Akira; Takase, Akira; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,256,899, Cl. 548-246.000.

Takayanagi, Shigetoshi: *See*—
Yoshida, Manabu; Fukuchi, Jun; and Takayanagi, Shigetoshi, 4,256,513, Cl. 136-256.000.

Takayanagi, Yoshikazu; Iizumi, Katsuo; Miyazawa, Masashi; Yamaya, Nobuyuki; and Tamura, Hajime, to Ajinomoto Company, Limited. Anhydrous L-lysine monohydrochloride in α-cyrstalline form and preparation thereof. 4,256,917, Cl. 562-562.000.

Takeda Chemical Industries: *See*—
Miyashita, Osamu; and Akimoto, Hiroshi, 4,256,746, Cl. 424-248.540.

Takeda Chemical Industries, Ltd.: *See*—
Itoga, Kiyoshi; Ogino, Fumiichi; Shirakawa, Kinichi; and Soga, Yasuyuki, 4,256,773, Cl. 426-415.000.
Nishino, Hiroshi; Aibe, Toshio; and Ogino, Fumiichi, 4,256,728, Cl. 422-4.000.

Takeuchi, Akihiro; and Asai, Kiyokazu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Constant current electrical circuit for driving piezoelectric transducer. 4,256,987, Cl. 310-316.000.

Takeuchi, Chifumi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of the harmonic synthesis type. 4,256,004, Cl. 84-1.210.

Takezono, Tetsuya; and Fujiwara, Yasuo, to Nippon Oil Co., Ltd. Method for producing methyl tert-butyl ether and fuel composition containing the same. 4,256,465, Cl. 44-56.000.

Tamura, Akihiko: *See*—
Tarumi, Noriyoshi; Tamura, Akihiko; Kokiso, Masakazu; Muramatsu, Toshio; and Nagayasu, Koichi, 4,256,822, Cl. 430-62.000.

Tamura, Hajime: *See*—
Takayanagi, Yoshikazu; Iizumi, Katsuo; Miyazawa, Masashi; Yamaya, Nobuyuki; and Tamura, Hajime, 4,256,917, Cl. 562-562.000.

Tamura, Kazuhiro; and Ninomiya, Saburo, to Yuasa Battery Company Limited. Sealed type battery. 4,256,812, Cl. 429-56.000.

Tamura, Nobuhiro: *See*—
Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, 4,256,645, Cl. 260-343.500.

Tanabe Seiyaku Co., Ltd.: *See*—
Hayashi, Kimiaki; Kato, Jyoji; Uchida, Tomofumi; and Yoneda, Naoto, 4,256,751, Cl. 424-258.000.

Tanaka, Hiromichi: *See*—
Asada, Akihiro; Tanaka, Hiromichi; and Ohta, Kaname, 4,256,980, Cl. 307-254.000.

Tanaka, Keihachiro: *See*—
Matsumoto, Jun; Tanigaki, Akira; Ohsato, Nobuyoshi; Tokuda, Nobuhiko; and Tanaka, Keihachiro, 4,256,478, Cl. 65-5.000.

Tanaka, Satoru: *See*—
Munakata, Keiichi; Tanaka, Satoru; Kanazawa, Tamotsu; Satoh, Masaru; Hase, Jun-ichi; and Kobashi, Kyoichi, 4,256,765, Cl. 424-315.000.

Tanaka, Shigeho: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.

Tanaka, Yoshiharu: *See*—
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.

Tanigaki, Akira: *See*—
Matsumoto, Jun; Tanigaki, Akira; Ohsato, Nobuyoshi; Tokuda, Nobuhiko; and Tanaka, Keihachiro, 4,256,478, Cl. 65-5.000.

Taniguchi, Hayashi: *See*—
Murayama, Noboru; and Taniguchi, Hayashi, 4,257,069, Cl. 358-261.000.

Taniguchi, Yoshiko: *See*—
Ohashi, Takashi; Okuyama, Toru; Kaneda, Hiroshi; Taniguchi, Yoshiko; and Yoshida, Masako, 4,256,846, Cl. 521-117.000.

Tannoy Products Limited: *See*—
Garner, Alex V.; and Townsend, Graham, 4,256,930, Cl. 179-116.000.

Tanouchi, Tadao: *See*—
Hayashi, Masaki; Tanouchi, Tadao; Kawamura, Masanori; and Kajiwara, Ikuo, 4,256,757, Cl. 424-273.00R.

Tara Materials, Inc.: *See*—
Klarman, Wallace, 4,255,886, Cl. 38-102.300.

Tarasen, William L., to Hitco. Epoxy resins containing chemically bonded metal atoms. 4,256,868, Cl. 528-9.000.

Tarasiuk, Stefan, to Biuro Projektowo-Konstrukcyjne Mechanizacji Budownictwa Zremb. Installation for removal of surplus material from a block of cellular concrete. 4,255,829, Cl. 15-303.000.

Tarumi, Noriyoshi; Tamura, Akihiko; Kokiso, Masakazu; Muramatsu, Toshio; and Nagayasu, Koichi, to Konishiroku Photo Industry Co., Ltd. Electrophotographic plate containing quaternary ammonium salt polymer interlayer. 4,256,822, Cl. 430-62.000.

Task, Harry L., to United States of America, Air Force. Color contrast sensitivity measuring device. 4,256,368, Cl. 350-408.000.

Tasnadi, Marta: *See*—
Gardi, Ivan; Gorog nee Privitzer, Katalin; Gaal, Sandor; Dudar, Erzsebet; Kocsis nee Bagyi, Maria; and Tasnadi, Marta, 4,256,481, Cl. 71-88.000.

Tatami, Mitsushige, to Sony Corporation. Quasi-vertical synchronizing signal generator. 4,257,073, Cl. 360-10.000.

Tate, Dan C., to Champion International Corporation. Waterproofing composition and method of making the same. 4,256,491, Cl. 106-2.000.

Tate, Dan C., to Champion International Corporation. Sulfur-free acidulation of tall oil soap. 4,256,628, Cl. 260-97.700.

Tateoka, Masamichi: *See*—
Minoura, Kazuo; Tateoka, Masamichi; and Minami, Setsuo, 4,256,364, Cl. 350-6.900.

Tauber, Oswald; Engelhardt, Gunther; Leitold, Matyas; and Schmidt, Gunther, to Boehringer Ingelheim GmbH. Antiphlogistic pharmaceutical compositions and method of use. 4,256,747, Cl. 424-250.000.

Taylor, Lloyd D., to Polaroid Corporation. Novel oxime polymers and process for preparing same. 4,256,614, Cl. 260-17.00A.

Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Degradable plastic composition containing unsaturated alcohol or ester thereof. 4,256,851, Cl. 525-1.000.

Taylor, Paul D.: *See*—
Vanderspurt, Thomas H.; and Taylor, Paul D., 4,256,675, Cl. 261-128.000.

Taylor, Ronald B. Guideline and layout ruler for calligraphers. 4,255,867, Cl. 33-464.000.

Tazuke, Shigeo; Kimura, Hitoshi; and Nakayama, Hiroyuki, to Kansai Paint Co., Ltd. Treating method for giving hydrophilic property to the surface of hydrophobic polymer substrate. 4,256,782, Cl. 427-53.100.

TDK Electronics Co., Ltd.: *See*—
Ishida, Toshihiko, 4,257,077, Cl. 360-130.330.
Shibata, Fujio, 4,257,078, Cl. 360-130.340.
Shirasaki, Shinji; Ohta, Katsuhiro; and Sugisaki, Takao, 4,257,040, Cl. 340-671.000.
Yoshizawa, Keiichi, 4,257,079, Cl. 360-137.000.

Technion Research and Development Foundation, Limited: *See*—
Meretsky, Paul L.; and Carmon, Amiram, 4,256,116, Cl. 128-421.000.

Teger, Gerhard: *See*—
Theissig, Werner; and Teger, Gerhard, 4,256,422, Cl. 408-241.00S.

Teichmann, Manfred: *See*—
Spaida, Hans-Peter; Scholtissek, Georg; and Teichmann, Manfred, 4,255,923, Cl. 56-364.000.

Teijin Engineering Ltd.: *See*—
Ono, Takezo; Watanabe, Mineo; and Iribe, Seiki, 4,256,559, Cl. 204-180.00P.

Teijin Limited: *See*—
Inata, Hiroo; Arakawa, Tamio; and Nishihara, Toshio, 4,256,558, Cl. 204-159.150.

Teledyne Industries, Inc.: *See*—
Carter, Dorothy P., 4,256,463, Cl. 23-296.000.

Telmet, Juhan: *See*—
Slavin, Michael; and Telmet, Juhan, 4,257,036, Cl. 340-388.000.

Temple, Victor A. K.: *See*—
Ferro, Armand P.; and Temple, Victor A. K., 4,257,058, Cl. 357-30.000.

Tennessee Valley Authority: *See*—
Harrison, Cecil P., 4,256,479, Cl. 71-61.000.

Teplitsky, Yakov S.: *See*—
Gorlovsky, David M.; Kucheryavy, Vladimir I.; Sineva, Kapitolina N.; Lebedev, Vladimir V.; Pikhtovnikov, Boris I.; Sergeev, Jury A.; Teplitsky, Yakov S.; Korshunov, Petr E.; and Simonov, Sergei M., 4,256,662, Cl. 564-67.000.

Terrel, Ronald L., to Sulphur Development Institute of Canada. Sulfur concrete composition and method of making shaped sulfur concrete articles. 4,256,499, Cl. 106-70.000.

Terrell Machine Company, The: *See*—
Terrell, Robert E., 4,256,228, Cl. 209-600.000.

Terrell, Robert E., to Terrell Machine Company, The. Apparatus for removing roving or the like from textile bobbins or the like. 4,256,228, Cl. 209-600.000.

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Shaw, Wilfrid G.; and Terrill, David B., 4,256,915, Cl. 562-535.000.

Teshima, Hiroshi: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.

Tetra Pak International AB: *See*—
Holmstrom, Sven N. H.; and Rosenberg, Knut A., 4,256,791, Cl. 428-77.000.

Tex-Del, Inc.: *See*—
Feighery, James M.; and Howden, Dwight E., 4,256,269, Cl. 242-66.000.

Texaco Development Corporation: *See*—
Gillespie, Ronald G., 4,256,695, Cl. 422-62.000.
McEntire, Edward E., 4,256,665, Cl. 564-135.000.
McEntire, Edward E., 4,256,666, Cl. 564-135.000.

Texaco Inc.: *See*—
Gunn, Kenneth M., 4,256,151, Cl. 141-59.000.
Schlinger, Warren C.; and Slater, William L., 4,256,654, Cl. 260-449.60R.
Sung, Rodney L.; and Zoleski, Benjamin H., 4,256,595, Cl. 252-51.50A.

Texas Instruments Incorporated: *See*—
Appelt, Daren R., 4,257,099, Cl. 364-200.000.
Maggi, Sergio, 4,256,976, Cl. 307-583.000.
Miles, Larry L., 4,257,045, Cl. 340-784.000.
Someshwar, Ashok H., 4,256,954, Cl. 235-92.0SH.

Thatcher, John T.: *See*—
Henderson, Gary A.; Thompson, William J. C.; and Thatcher, John T., 4,256,771, Cl. 426-250.000.

Theall, Charles E., Jr., to Singer Company, The. Receiver for unipolar Manchester fiber optics signals. 4,257,125, Cl. 455-608.000.

Theall, Charles E., Jr., to Singer Company, The. Logarithmic receiver for fiber optic signals. 4,257,126, Cl. 455-619.000.

Thebeau, Vital J., to Canadian Patents and Development Limited. Humane animal trap. 4,255,892, Cl. 43-81.000.

Theeuwes, Felix, to Alza Corporation. Microporous-semipermeable laminated osmotic system. 4,256,108, Cl. 128-260.000.

Theissig, Werner; and Teger, Gerhard, to Hilti Aktiengesellschaft. Drilling machine with a drilling stop. 4,256,422, Cl. 408-241.00S.

Thellmann, Edward L.: *See*—
Doubrava, James H.; and Thellmann, Edward L., 4,256,810, Cl. 428-550.000.

Thermatool Corp.: *See*—
Huppunen, Robert D.; and Harriau, Robert R., 4,256,252, Cl. 228-1.00A.

Thermon Manufacturing Company: *See*—
Goss, David C.; and Hageman, Richard A., 4,256,452, Cl. 432-225.000.

Theuerkauf, Heinz: *See*—
Schulz, Alfred; Boning, Bernward; Kiencke, Uwe; Theuerkauf, Heinz; Gast, Theodor; Honig, Gunter; and Nagel, Rudolf, 4,255,965, Cl. 73-35.000.

Thiersch, Friedrich: *See*—
Strobel, Manfred; and Thiersch, Friedrich, 4,256,540, Cl. 202-139.000.

Thies, Peter Willibrord; and Asai, Akiji, to Kali-Chemie Pharma GmbH. Pharmaceutically active 2,9-dioxatricyclo[4,3,1,$0^{3,7}$] decanes. 4,256,642, Cl. 260-340.300.

Thomas, Alfred W., to Girling Limited. Servo booster for vehicle braking systems. 4,256,016, Cl. 91-369.00A.

Thomas & Betts Corporation: *See*—
Foley, Robert G., 4,255,857, Cl. 30-363.000.
Helms, William E.; and Adams, Jack W., 4,257,002, Cl. 324-66.000.
Narozny, Ronald S.; and Wilson, Albert H., 4,257,028, Cl. 339-126.00R.
Storck, Glenn E., 4,256,359, Cl. 339-97.00C.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Drawer type sterilizer unit. 4,256,952, Cl. 219-521.000.

Thomas, Rudy V., to Allied Chemical Corporation. Automatic articulation device for passive seat belt systems. 4,256,328, Cl. 280-802.000.

Thompson, David E.; and Haggstrom, Walter R. G. Method of scraping corners. 4,256,510, Cl. 134-6.000.

Thompson, William J. C.: *See*—
Henderson, Gary A.; Thompson, William J. C.; and Thatcher, John T., 4,256,771, Cl. 426-250.000.

Thompson, William P.: *See*—
Swan, Algernon G.; Stead, Eugene A., Jr.; Thompson, William P.; and Colvin, David P., 4,256,098, Cl. 128-133.000.

Thomson-CSF: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,256,656, Cl. 260-465.00D.
Coussot, Gerard; Menager, Olivier; and Van Den Driessche, Michel, 4,257,021, Cl. 333-195.000.
Gonin, Roger B.; Fontanes, Sylvain; and Picquendar, Jean E., 4,257,019, Cl. 333-165.000.

Thorington, Luke: *See*—
Trutner, Donald G.; Kovacs, David; Fontana, Raymond P.; and Thorington, Luke, 4,256,989, Cl. 313-318.000.

Thorn, Joseph R. Fuel conserving engine improvement. 4,256,064, Cl. 123-59.0EC.

Thorn Lighting Limited: *See*—
Coaton, James R.; Rees, John M.; and Rothon, Roger N., 4,256,988, Cl. 313-221.000.

Thorneburg, James L. Athletic socks with integrally knit arch cushion. 4,255,949, Cl. 66-185.000.

Thorsrud, Agmund K., to Phillips Petroleum Company. Article and process simulating plantation crepe rubber. 4,256,850, Cl. 521-139.000.

Tilly, Lynn K.: *See*—
Kemper, James M.; and Tilly, Lynn K., 4,256,041, Cl. 105-197.0DB.

Timossi, Giovanni: *See*—
Dellepiane, Enrico; Ricci, Roberto; and Timossi, Giovanni, 4,256,291, Cl. 266-272.000.

Tippetts, Thomas B.; and Manion, Francis M., to Garrett Corporation, The; and United States of America, America. Fluidic stabilization control. 4,256,015, Cl. 91-364.000.

Tkach, Grigory A.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.

Tkachenko, Georgy P.: *See*—
Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M., 4,256,709, Cl. 423-119.000.

Tobias, John W.: *See*—
Taylor, Lynn J.; and Tobias, John W., 4,256,851, Cl. 525-1.000.

Todhunter, John D.: *See*—
Shaw, Howard A.; and Todhunter, John D., 4,256,213, Cl. 198-303.000.

Toho Beslon Co., Ltd.: *See*—
Yoshida, Masatoshi; and Hirai, Minoru, 4,256,607, Cl. 252-117.000.

Tokai TRW & Co. Ltd.: *See*—
Abe, Michio, 4,256,413, Cl. 403-282.000.

Tokan Kogyo Kabushiki Kaisha: *See*—
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, 4,256,239, Cl. 220-270.000.

Tokico Ltd.: *See*—
Karasudani, Yasuo, 4,256,207, Cl. 188-72.700.

Tokuda, Nobuhiko: *See*—
Matsumoto, Jun; Tanigaki, Akira; Ohsato, Nobuyoshi; Tokuda, Nobuhiko; and Tanaka, Keihachiro, 4,256,478, Cl. 65-5.000.

Tokudome, Katumi: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katumi; Ishikawa, Michio; and Hayashi, Yuzi, 4,257,014, Cl. 331-94.5PE.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kamijo, Naoyoshi, 4,257,023, Cl. 335-211.000.
Shimoma, Taketoshi; Fukuda, Kumio; and Nakamura, Michio, 4,257,024, Cl. 335-213.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Tsuchiko, Masayoshi, 4,257,043, Cl. 340-722.000.

Tom McGuane Industries, Inc.: *See*—
Burgess, Ronald R., 4,256,293, Cl. 267-123.000.

Tomalia, Donald A.: *See*—
Chamberlin, Thomas A.; and Tomalia, Donald A., 4,256,855, Cl. 525-326.000.

Tomassini, Osvaldo, to Pascucci, Eugene, a part interest. Apparatus for the exploitation of underwater currents for the production of electrical energy. 4,256,970, Cl. 290-53.000.

Tomek, Martin L.: *See*—
Fox, Fred K.; and Tomek, Martin L., 4,256,189, Cl. 175-40.000.

Tominaga, Michiaki: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,256,890, Cl. 546-158.000.

Tominoi, Kinitada, to AMP Incorporated. Wire feed and contact insertion apparatus. 4,255,850, Cl. 29-742.000.

Tomotsugu, Heiji: *See*—
Kosodo, Hiroshi; Tomotsugu, Heiji; and Kudo, Hiroshi, 4,256,439, Cl. 417-216.000.

Torri, Masaaki: *See*—
Yamamoto, Ryuichi; and Torri, Masaaki, 4,256,672, Cl. 260-974.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru; Banzai, Hideo; and Goto, Takashi, 4,256,678, Cl. 264-40.100.

Towler, Brian: *See*—
Wilson, John F.; and Towler, Brian, 4,256,555, Cl. 204-129.500.

Townsend, Graham: *See*—
Garner, Alex V.; and Townsend, Graham, 4,256,930, Cl. 179-116.000.

Toy, Stephen T.: *See*—
Hoehn, Harvey H.; and Toy, Stephen T., 4,256,588, Cl. 210-692.000.

Toyo Soda Manufacturing Co. Ltd.: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.
Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, 4,256,842, Cl. 521-53.000.
Sasaki, Hiroo; Komiya, Katsuo; and Kato, Yoshio, 4,256,843, Cl. 521-53.000.

Toyoda, Tsunehiko: *See*—
Yokoyama, Sigeaki; Toyoda, Tsunehiko; and Okamura, Noriaki, 4,256,493, Cl. 106-22.000.

Toyota Jidosha Kogya Kabushiki Kaisha: *See*—
Mukoyama, Makoto, 4,255,986, Cl. 74-492.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kobashi, Mamoru; and Ogawa, Toshihisa, 4,256,073, Cl. 123-422.000.
Kobayashi, Katsuyuki, 4,255,943, Cl. 64-21.000.
Nakatomi, Takayoshi; and Aoki, Keiji, 4,256,072, Cl. 123-415.000.
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,256,063, Cl. 123-52.00M.

Toyoto Jidosha Kogyo Kabushiki Kaisha: *See*—
Morishita, Teru, 4,255,935, Cl. 60-745.000.

Travin, Oleg V.: *See*—
Bobkova, Olga S.; Slotvinsky-Sidak, Nikolai P.; Travin, Oleg V.; and Frolov, Averky A., 4,256,487, Cl. 75-134.00V.

Trayler, Robert J.: *See*—
Mitchell, Roger R.; Trayler, Robert J.; and Wilson, Eugene M., 4,255,885, Cl. 37-126.0AE.

Treharne, Richard W.; McKibben, Charlton K.; Moles, Donald R.; and Bruce, Mitchell R. M., to Charles F. Kettering Foundation. Arc reactor device. 4,256,967, Cl. 250-544.000.

Treheux, Michel E.; and Lacroix, Rene J. Space division switching system for communication networks using optical signal frequencies. 4,256,927, Cl. 179-18.00E.

Triplett, John W.; and Smith, Randall B., to University of Kentucky Research Foundation, The. Synthesis and use of diagnostic radiopharmaceuticals comprising radioactive isotopes of bromine with dyes. 4,256,727, Cl. 424-1.500.

Tropin, Sergei N.: *See*—
Chabanov, Alim I.; Daniljuk, Valery V.; Rusaev, Vladimir I.; Tropin, Sergei N.; Grinchuk, Petr S.; Ponomarev, Viktor I.; Fomin, Georgy G.; Miro; Shnikov, Ivan K.; Bogaenko, Ivan N.; and Pisarenko, Vladimir M., 4,255,954, Cl. 72-19.000.

Trulove, Chris D. Bicycle camper-trailer. 4,256,321, Cl. 280-204.000.

Trutner, Donald G.; Kovacs, David; Fontana, Raymond P.; and Thorington, Luke, to Duro Test Corporation. Incandescent lamp with filament mounting means and socket adaptor. 4,256,989, Cl. 313-318.000.

Tsai, Yih-Wan; and Duffus, Robert H., to PPG Industries, Inc. Two regenerator-flue system for regenerative furnaces. 4,256,173, Cl. 165-9.300.

Tsuchiko, Masayoshi, to Tokyo Shibaura Electric Co., Ltd. Multichannel display device. 4,257,043, Cl. 340-722.000.

Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, to Bridgestone Tire Co., Ltd. Method for effectively utilizing waste tires. 4,256,503, Cl. 106-100.000.

Tsuda, Yoshihisa: *See*—
Jackson, Denise M.; Tsuda, Yoshihisa; and Winans, Vida, 4,256,838, Cl. 435-234.000.

Tsuji, Toshio: *See*—
Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, 4,256,503, Cl. 106-100.000.

Tsujimoto, Susumu; Yamazaki, Hayao; Ozaki, Masayoshi; and Kobayashi, Takehiro, to Sharp Kabushiki Kaisha. Hair waving appliance with infrared heaters and an ultrasonic atomizer. 4,256,127, Cl. 132-9.000.

Tsukuda, Kiyoshi: *See*—
Kawamata, Shigeru; and Tsukuda, Kiyoshi, 4,257,060, Cl. 357-49.000.

Tsuzuki, Toshio: *See*—
Naitou, Takao; and Tsuzuki, Toshio, 4,256,238, Cl. 221-263.000.

Tucker, Elton M.: *See*—
Kapp, John P.; Robertson, James T.; and Tucker, Elton M., 4,256,094, Cl. 128-24.00R.

Tugukuni, Hideyoshi; and Kano, Masafumi, to Dal Nippon Tokyo Co., Ltd. Powdery coating composition and process for preparing the same. 4,256,805, Cl. 428-357.000.

Tungum Hydraulics Limited: *See*—
Braithwaite, Philip, 4,255,899, Cl. 49-2.000.

Turner, Richard T.: *See*—
McCullough, J. Warren; Poland, Terrell A.; Reynolds, Dale N.; Slack, Keith K.; and Turner, Richard T., 4,257,096, Cl. 364-200.000.

Turns, Earl W.; Forrester, Robert E., Jr.; and Porter, Arthur C., to General Dynamics Corporation. Universal chromic acid anodizing method. 4,256,547, Cl. 204-35.00N.

Turpin, Raymond C., Jr., to Partners Limited, The, a part interest. Pozzolan cement compositions. 4,256,500, Cl. 106-88.000.

Tuschhoff, John V.; Eastman, James E.; and Schanefelt Robert V., to A. E. Staley Manufacturing Company. Physical modification of the viscosity characteristics of starchy flours. 4,256,509, Cl. 127-32.000.

Tuttle, Lawrence L.: *See*—
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,256,553, Cl. 204-106.000.

Tybus, Gerd; and Laube, Hilmar, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Rod-shaped connecting element. 4,256,412, Cl. 403-267.000.

Tyrtyshny, Vladilen M.; and Bolotov, Albert A. Evaporator. 4,256,536, Cl. 159-16.00S.

Tytgat, Daniel; Degols, Albert; and Dujardin, Francois, to Solvay & Cie. Process and device for monitoring the change in the surface condition of a metal component in an installation containing an ionic phase. 4,256,542, Cl. 204-1.00T.

Ube Industries, Ltd.: *See*—
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, 4,256,908, Cl. 560-204.000.
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, 4,256,914, Cl. 562-535.000.

Uchida, Tomofumi: *See*—
Hayashi, Kimiaki; Kato, Jyoji; Uchida, Tomofumi; and Yoneda, Naoto, 4,256,751, Cl. 424-258.000.

Ueda, Shunro: *See*—
Tsuda, Akikazu; Kikuchi, Motokazu; Shimazaki, Tadatoshi; Tsuji, Toshio; Ueda, Shunro; and Kabaya, Masamichi, 4,256,503, Cl. 106-100.000.

Uemura, Morito: *See*—
Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, 4,256,831, Cl. 430-562.000.

Uhara, Hiroyuki: *See*—
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, 4,256,783, Cl. 422-197.000.

Ulbrich, Hans-Joachim: *See*—
Quester, Karl W.; Haas, Johannes; Ulbrich, Hans-Joachim; and Schroder, Dieter, 4,255,869, Cl. 34-25.000.

Ullman, Anders: *See*—
Roos, Bertil; and Ullman, Anders, 4,256,586, Cl. 210-487.000.

Ullman, Edwin F.: *See*—
Zuk, Robert F.; and Ullman, Edwin F., 4,256,834, Cl. 435-7.000.

Umeda, Jun-ichi: *See*—
Nakamura, Michiharu; Yamashita, Shigeo; Kuroda, Takao; and Umeda, Jun-ichi, 4,257,011, Cl. 331-94.50H.

Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Suzuki, Kenichi; Hogami, Toshihiko; and Fuginaga, Masataka, to Ube Industries, Ltd. Catalytic oxidation of methacrolein. 4,256,914, Cl. 562-535.000.

Umen, Michael J., to McNeil Laboratories, Inc. (2-Amino-2-oxoethoxy)acetic acid compounds. 4,256,891, Cl. 546-234.000.

Union Carbide Corporation: *See*—
Ashworth, Robert W.; and Fu, Wallace Y., 4,256,655, Cl. 260-453.0RW.
Baumann, Stephen F.; Nakabayashi, Masahiro; Uttrachi, Gerald D.; Coless, Thomas L.; and Levine, Ernest N., 4,256,949, Cl. 219-146.240.
Havens, Marvin R.; Fields, Donald R.; and Miller, Douglas J., 4,256,317, Cl. 277-112.000.
Smilanich, Nicholas J.; and Reichert, Samuel F., 4,256,815, Cl. 429-185.000.
Wheeler, Thomas N., 4,256,657, Cl. 260-465.00D.

Wheeler, Thomas N., 4,256,658, Cl. 260-465.00D.
Wheeler, Thomas N., 4,256,659, Cl. 260-465.00D.
United States Gypsum Company: *See—*
Wendt, Alan C., 4,255,910, Cl. 52-481.000.
United States of America
Air Force: *See—*
Briones, Robert A., 4,256,363, Cl. 350-3.860.
Task, Harry L., 4,256,368, Cl. 350-408.000.
America: *See—*
Tippetts, Thomas B.; and Manion, Francis M., 4,256,015, Cl. 91-364.000.
Army: *See—*
Dias, Gil M.; and Delasanta, Armando C., 4,256,786, Cl. 427-244.000.
Ravis, James C., 4,257,089, Cl. 363-25.000.
Energy: *See—*
Bradley, Laird P.; Carder, Bruce M.; and Gagnon, William L., 4,257,017, Cl. 332-7.510.
Dietz, Russell N.; and Senum, Gunnar I., 4,256,038, Cl. 102-28.00R.
Karplus, Henry H. B., 4,255,973, Cl. 73-704.000.
Health, Education and Welfare: *See—*
Bend, John R.; Eling, Thomas E.; and McKinney, James D., 4,256,646, Cl. 260-345.80P.
Interior: *See—*
Atkinson, Gary B., 4,256,653, Cl. 260-449.60M.
Carnahan, Thomas G.; and Flynn, Charles M., Jr., 4,256,587, Cl. 210-670.000.
Dunstan, Edwin R., Jr., 4,256,504, Cl. 106-109.000.
Flynn, Charles M., Jr.; Carnahan, Thomas G.; and Lindstrom, Roald E., 4,256,707, Cl. 423-42.000.
Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., 4,256,705, Cl. 423-27.000.
Heinen, Harold J.; McClelland, Gene E.; and Lindstrom, Roald E., 4,256,706, Cl. 423-29.000.
Soboroff, David M.; and McDonald, Hector O., 4,256,557, Cl. 204-149.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
McDougal, Allan R. Hot gas engine with dual crankshafts. 4,255,929, Cl. 60-517.000.
National Aeronautics and Space Administration: *See—*
Helms, Curtis R.; and Smyly, Harold M., 4,256,093, Cl. 128-1.00R.
Navy: *See—*
Blankenship, John E.; and Hoback, Roy W., 4,255,916, Cl. 53-404.000.
Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., 4,257,007, Cl. 328-167.000.
Brown, Craig K., 4,257,082, Cl. 361-191.000.
Lucian, A. D., deceased, 4,256,965, Cl. 250-367.000.
Sears, James T., 4,255,866, Cl. 33-361.000.
U.S. Philips Corporation: *See—*
Daniel, Peter J., 4,256,829, Cl. 430-312.000.
Igel, Anders N. E., 4,257,108, Cl. 364-900.000.
Juhnke, Klaus; and Harlos, Hartmut, 4,256,981, Cl. 307-266.000.
Luursema, Meerten, 4,256,992, Cl. 315-106.000.
United States Steel Corporation: *See—*
Ives, Kenneth D., 4,256,169, Cl. 164-448.000.
United States Tobacco Company: *See—*
Siwerstam, Jan, 4,255,924, Cl. 57-24.000.
United Technologies Corporation: *See—*
Cornwell, Dean F., 4,256,958, Cl. 250-233.000.
Prewo, Karl M.; and Stalcup, Robert K., 4,256,378, Cl. 350-310.000.
Sokol, Larry S.; McComas, Charles C.; and Hanna, Earl M., 4,256,779, Cl. 427-34.000.
Universal Manufacturing Co., Inc.: *See—*
Fahrbach, Rudolf, 4,256,268, Cl. 242-7.110.
University of Illinois Foundation: *See—*
Hess, Karl; Streetman, Ben G.; and Morkoc, Hadis, 4,257,055, Cl. 357-16.000.
University of Iowa Research Foundation: *See—*
Frank, Clyde W.; Nord, Paul J.; and Cox, Robert D., 4,256,462, Cl. 23-230.00R.
University of Kentucky Research Foundation, The: *See—*
Triplett, John W.; and Smith, Randall B., 4,256,727, Cl. 424-1.500.
University of Minnesota, The Regents of the: *See—*
Schaumann, Rolf, 4,257,006, Cl. 328-127.000.
University of Va. Alumni Patents Foundation: *See—*
Biltonen, Rodney L.; Mountcastle, Donald B.; and Suurkuust, Jaak, 4,255,961, Cl. 73-15.00B.
Uno, Hitoshi; Nagai, Yasutaka; Hino, Katsuhiko; and Nakamura, Hideo, to Dainippon Pharmaceutical Co., Ltd. 4-(2-Pyridylamino)phenylacetic acid derivatives. 4,256,753, Cl. 424-263.000.
UOP Inc.: *See—*
Antos, George J., 4,256,566, Cl. 208-139.000.
Antos, George J., 4,256,608, Cl. 252-441.000.
Homeier, Edwin H., 4,256,670, Cl. 564-416.000.
Jackson, Denise M.; Tsuda, Yoshihisa; and Winans, Vida, 4,256,838, Cl. 435-234.000.
Urban, Peter, 4,256,713, Cl. 423-242.000.
Upjohn Company, The: *See—*
Harrison, Roger G., Jr.; and Prichard, Thomas H., 4,256,876, Cl. 536-12.000.
Kelly, Robert C.; and Wierenga, Wendell, 4,256,898, Cl. 548-240.000.
Koehler, Charles E.; McClellan, Thomas R.; and Murray, Pat L., 4,256,802, Cl. 428-310.000.
Sih, John C., 4,256,648, Cl. 260-346.220.
Sih, John C., 4,256,663, Cl. 564-188.000.
Sih, John C., 4,256,667, Cl. 564-384.000.
Sih, John C., 4,256,905, Cl. 560-119.000.
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Youngdale, Gilbert A., 4,256,651, Cl. 260-410.90R.
Uptrend Products Ltd.: *See—*
Bovet, Thomas, 4,256,195, Cl. 177-232.000.
Urban, Eugene M., Jr., to Cities Service Company. Process for preparing precipitated red iron oxides. 4,256,723, Cl. 423-633.000.
Urban, John A.: *See—*
Najer, Leonard M.; and Urban, John A., 4,256,208, Cl. 188-196.00D.
Urban, Peter, to UOP Inc. Flue gas treatment with intermittent addition of alkaline reagent to scrubbing liquor. 4,256,713, Cl. 423-242.000.
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Carle, George E., 4,256,448, Cl. 425-367.000.
Morris, Roy; and Pickering, Terence J., 4,256,968, Cl. 250-560.000.
Usui, Fumio. Method and apparatus for producing reinforced synthetic resin pipe. 4,256,680, Cl. 264-71.000.
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Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,256,761, Cl. 424-282.000.
Utaka, Tadashi: *See—*
Shoji, Takashi; and Utaka, Tadashi, 4,256,961, Cl. 250-272.000.
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Baumann, Stephen F.; Nakabayashi, Masahiro; Uttrachi, Gerald D.; Coless, Thomas L.; and Levine, Ernest N., 4,256,949, Cl. 219-146.240.
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Batcho, Andrew D.; Hengartner, Urs O.; Leimgruber, Willy; Scott, John W.; and Valentine, Donald, Jr., 4,256,641, Cl. 260-326.14T.
Vanada, James R.: *See—*
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van Andel, Eleonoor, to Akzo N.V. Process for the combined manufacture of chlorinated hydrocarbons and sodium bicarbonate. 4,256,719, Cl. 423-424.000.
Van Baush, Edward H., to Hydrocarbon Research, Inc. Low temperature process for the recovery of ethane from thermal hydrocracking vent gases. 4,256,476, Cl. 62-23.000.
Van Den Driessche, Michel: *See—*
Coussot, Gerard; Menager, Olivier; and Van Den Driessche, Michel, 4,257,021, Cl. 333-195.000.
Vanderbilt, Jeffrey J.; Gose, William C.; and Cleveland, James P., to Eastman Kodak Company. Preparation of 2-chloropyrimidines. 4,256,888, Cl. 544-334.000.
Vanderspurt, Thomas H.; and Taylor, Paul D., to Celanese Corporation. Method for generating super atmospheric pressures of sensitive materials in a gas stream. 4,256,675, Cl. 261-128.000.
VanDuyn, Allen E.: *See—*
Clark, Clinton B., Jr.; Corbett, Scott S., Jr.; and VanDuyn, Allen E., 4,256,230, Cl. 212-216.000.
Van Ginkel, Mannes; and Plug, Jan, to Moba Holding Barneveld B.V. Modelling apparatus for poultry. 4,255,831, Cl. 17-11.000.
van Ginkel, Mannes; and Plug, Jan, to Moba Holding Barneveld B.V. Device for handling objects. 4,255,832, Cl. 17-11.000.
VanGorden, Steven N.: *See—*
Fisher, Gary J.; Morean, James E.; Simmons, Perley F.; and VanGorden, Steven N., 4,256,390, Cl. 354-1.000.
Van Pottelberg, Gaston C. Barometer mechanism. 4,255,970, Cl. 73-386.000.
Van Wyk, Jan W., to Boeing Company, The. Low wear high current density sliding electrical contact material. 4,256,489, Cl. 75-173.00R.
Varel, Daniel W., to Varel Manufacturing Company. Rotary drill bit having a solid forged, unitary body. 4,256,194, Cl. 175-375.000.
Varel Manufacturing Company: *See—*
Varel, Daniel W., 4,256,194, Cl. 175-375.000.
Varga, Julianna K.: *See—*
Franks, Neal E.; and Varga, Julianna K., 4,256,613, Cl. 260-13.000.
Vassar, Clyde W., to Kemerer, W. James, a part interest. Variable profile extrusion method. 4,256,685, Cl. 264-167.000.
Vasseur, Bernard; and Boucaut, Alain, to Lita. Set of connecting accessories for an electrical supply rail with an asymmetrical profile. 4,256,357, Cl. 339-21.00R.
Veb Elektronische Erzeugnisse Barenstein: *See—*
Streller, Bernd; and Lehmann, Heinz, 4,256,397, Cl. 354-250.000.
VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen: *See—*
Spaida, Hans-Peter; Scholtissek, Georg; and Teichmann, Manfred, 4,255,923, Cl. 56-364.000.
Velotron Machine Corp.: *See—*
Cohen, Samuel W.; and Infantino, Settimio, 4,256,385, Cl. 351-13.000.
Velsicol Chemical Corporation: *See—*
Stach, Leonard J., 4,256,741, Cl. 424-200.000.
Verboom, Pieter, to I.H.C. Holland N.V. Dragging type cutter head for a suction dredger. 4,255,882, Cl. 37-66.000.
Verduin, Lee C.; and Kitchka, Paul E., to Rowe International, Inc. Disco lamp controller for coin-operated phonograph. 4,256,009, Cl. 84-464.00R.
Vertegaal, Jacobus G., to Stork-Brabant B.V. Apparatus for intermittent printing. 4,256,037, Cl. 101-115.000.
Vial, Jean: *See—*
Lyaudet, Georges; and Vial, Jean, 4,256,702, Cl. 423-7.000.

Vianova Kunstharz, A.G.: *See—*
Aigner, Hansjorg; Behmel, Klaus; and Luttenberger, Johann, 4,256,620, Cl. 260-29.6HN.

Vibram S.p.A.: *See—*
Sironi, Giuseppe, 4,255,874, Cl. 36-32.00R.

Vickers Limited: *See—*
Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., 4,255,966, Cl. 73-81.000.

Vickery, Brian H.: *See—*
Nestor, John J.; and Vickery, Brian H., 4,256,737, Cl. 424-177.000.

Victor Company of Japan, Ltd.: *See—*
Naruse, Tunehide; and Matsumoto, Ikuo, 4,256,852, Cl. 525-6.000.

Victor, James G.: *See—*
Wolsky, Alfred A.; Papp, Richard B.; and Victor, James G., 4,256,912, Cl. 560-248.000.

Vieweg, Gunther: *See—*
Petrak, Heinz; Vieweg, Gunther; and Weinicke, Martin, 4,256,352, Cl. 308-10.000.

Vigar, James M. L.: *See—*
Barclay, Donald J.; and Vigar, James M. L., 4,256,548, Cl. 204-43.00R.

Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,256,121, Cl. 131-9.000.

Vincent, Roger: *See—*
Achard, Georges; Anouilh, Gilbert; Chion, Pierre; and Vincent, Roger, 4,256,684, Cl. 264-168.000.

Vindum, Jorgen O., to Acurex Corporation. Solar concentrator utilizing a point focusing solar concentrating panel assembly. 4,256,088, Cl. 126-418.000.

Vinick, Fredric J., to Pfizer Inc. Process for the preparation of L-aspartic acid N-thiocarboxyanhydride. 4,256,897, Cl. 548-183.000.

Vitamins, Inc.: *See—*
Rice, Wayne K., 4,256,769, Cl. 426-72.000.

Vivitar Corporation: *See—*
Kreitzer, Melvyn H., 4,256,381, Cl. 350-423.000.

Vladimirov, Pavel S.: *See—*
Sizyakov, Viktor M.; Bilenko, Leonid F.; Shmorgunenko, Nikolai S.; Finkelshtein, Leonid I.; Tkachenko, Georgy P.; Alexeev, Oleg V.; Aronzon, Vitaly L.; Vladimirov, Pavel S.; Alexeev, Alexei I.; and Kostin, Ivan M., 4,256,709, Cl. 423-119.000.

VLSI Technology Research Association: *See—*
Mizukami, Koichiro; and Migitaka, Masatoshi, 4,256,778, Cl. 427-10.000.

Vock, Manfred H.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,256,121, Cl. 131-9.000.
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Vodarich, Umberto. Bag making apparatus. 4,256,023, Cl. 493-266.000.

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Neuner, Ludwig; and Laimer, Friedrich, 4,256,289, Cl. 266-159.000.

Vogelgesang, Peter J.: *See—*
Wysocki, Steve S.; Nelson, Norman E.; and Vogelgesang, Peter J., 4,257,075, Cl. 360-96.500.

Voigt, Armin: *See—*
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., 4,256,830, Cl. 430-372.000.

Volkert, Otto: *See—*
Horacek, Heinrich; Schoen, Ernst; Reich, Erhardt; and Volkert, Otto, 4,256,841, Cl. 521-51.000.

Volkova, Nina M.: *See—*
Shafranovsky, Alexandr V.; Ruchinsky, Vitaly R.; Kurkovskaya, Violetta V.; Olevsky, Viktor M.; Baskov, Jury A.; Chubukov, Vladimir K.; Gavrilin, Vladimir P.; and Volkova, Nina M., 4,256,674, Cl. 261-112.000.

Volkswagenwerk AG: *See—*
Schwanz, Wilfried; and Seiffert, Ulrich, 4,256,331, Cl. 280-804.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Schafer, Hans-Jurgen, 4,256,062, Cl. 123-52.00M.

von Bebenburg, Walter; Schulmeyer, Norbert; and Szelenyi, Istvan, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Treatment of ulcers with acylated aminoalkyl cyanoguanidines containing a heterocyclic residue. 4,256,752, Cl. 424-263.000.

Von Bokern, Greg J.: *See—*
Porter, David R.; Reese, Irving R.; and Von Bokern, Greg J., 4,257,124, Cl. 455-601.000.

von Konig, Anita: *See—*
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., 4,256,830, Cl. 430-372.000.

von Starck, Axel; Gerbig, Hans E.; Schrewe, Hans; Sardemann, Jurgen; and Glaser, Josef, to Mannesmann Aktiengesellschaft; and AEG-Elotherm GmbH. Stirring of molten metal core in a casting as withdrawn from a machine for continuous casting. 4,256,165, Cl. 164-147.000.

Vorbruggen, Helmut: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,256,745, Cl. 424-248.550.

Voser, Richard: *See—*
Fluri, Peter; Voser, Richard; and Wettstein, Peter, 4,256,837, Cl. 435-167.000.

Votta, Gerald A.: *See—*
Garzon, Ruben D.; McConnell, Lorne D.; and Votta, Gerald A., 4,256,939, Cl. 200-147.00R.

Vrieland, G. Edwin: *See—*
Steiner, Edwin C.; and Vrieland, G. Edwin, 4,256,895, Cl. 546-345.000.

W. Haldenwanger KG: *See—*
Froschauer, L. E.; Knape, R. U. B.; and Schmidt, D. H., 4,256,686, Cl. 264-209.000.

W-K-M Wellhead Systems, Inc.: *See—*
Peters, Clifford M., 4,256,141, Cl. 137-557.000.

W. L. Gore & Associates, Inc.: *See—*
Snyder, Ritchie A., 4,256,806, Cl. 428-378.000.

W. R. Grace & Co.: *See—*
Denton, Dean A., 4,256,682, Cl. 264-109.000.

Wachter, Michael P., to Ortho Pharmaceutical Corporation. Chemical intermediates in the preparation of oxepane compounds. 4,256,644, Cl. 260-340.90R.

Wacker-Chemie GmbH: *See—*
Zajicek, Otmar; Kirschner, Jurgen; Klapp, Helmut; and Rompeltien, Rainer, 4,256,470, Cl. 55-48.000.

Waddington, Clive, to Avco Corporation. Electric vehicle with waddington drive. 4,256,196, Cl. 180-65.00E.

Waid, George M.; and Davenport, Anthony T., to Republic Steel Corporation. Welded alloy casing. 4,256,517, Cl. 148-36.000.

Wakeham, Helmut R. R.: *See—*
Lendvay, Andrew T.; Wakeham, Helmut R. R.; and Keritsis, Gus D., 4,256,123, Cl. 131-17.00A.

Walker Crosweller & Company Limited: *See—*
Green, Peter T.; and Beck, Nicholas J., 4,256,263, Cl. 239-487.000.

Walker, Gordon N., to Ciba-Geigy Corporation. Alphacarbamoyl-pyrrolpropionitriles. 4,256,759, Cl. 424-274.000.

Walker, Starnes E., to Phillips Petroleum Company. Optoelectronic feedback control for a spectrometer. 4,256,404, Cl. 356-316.000.

Wallace, Charles H., to International Telephone and Telegraph Corporation. Arrangement to improve the optimization of the value of finished cuts in a livestock processing plant. 4,256,569, Cl. 209-3.300.

Wallace-Murray Corporation: *See—*
Arora, Gulshan K., 4,256,441, Cl. 417-407.000.

Wallace, William D.; Cutler, Christopher A.; Clark, Justin S.; and Farr, Frederick L. Method and apparatus for equilibrating gas and liquid in a transportable vessel—syringe tonometer. 4,256,461, Cl. 23-230.00B.

Wallshein, Melvin. Tooth uprighting or separating appliance. 4,256,456, Cl. 433-21.000.

Walter, Lothar: *See—*
Kunkel, Heinrich; Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,256,193, Cl. 175-371.000.

Walters, Harry J.: *See—*
Gerben, Ralph D.; and Walters, Harry J., 4,256,218, Cl. 198-621.000.

Wang, David N.: *See—*
Levinstein, Hyman J.; and Wang, David N., 4,256,534, Cl. 156-643.000.

Wang, Richard H. S.; and Zannucci, Joseph S., to Eastman Kodak Company. Multichromophoric ultraviolet stabilizers and their use in organic compositions. 4,256,626, Cl. 260-45.80N.

Wank, Joachim: *See—*
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, 4,256,862, Cl. 525-534.000.

Wappler, Joachim H. R. Universal fork assembly. 4,256,337, Cl. 294-67.00A.

Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Chemical cartridge for respirators. 4,256,698, Cl. 422-122.000.

Watanabe, Kazumasa: *See—*
Kanbe, Masaru; Watanabe, Kazumasa; Uemura, Morito; Takahashi, Jiro; Kobayashi, Ryuichiro; and Kobayashi, Tatsuhiko, 4,256,831, Cl. 430-562.000.

Watanabe, Mineo: *See—*
Ono, Takezo; Watanabe, Mineo; and Iribe, Seiki, 4,256,559, Cl. 204-180.00P.

Watanabe, Tetsuro: *See—*
Seki, Shigeo; Sekizawa, Yashuharu; Kai, Fumio; Suzuki, Yukio; Iwata, Michiaki; and Watanabe, Tetsuro, 4,256,744, Cl. 424-248.510.

Watson, Richard W.: *See—*
Blakey, Philip G.; and Watson, Richard W., 4,256,721, Cl. 423-540.000.

Weaver, William D.; and Simon, Warren J., to Ampco Foods Inc. Method for making fried potato pieces having the peel retained thereon. 4,256,777, Cl. 426-637.000.

Webb, Norma J.: *See—*
Webb, Norman J.; and Bories, David, 4,257,039, Cl. 340-629.000.

Webb, Norman J.; and Bories, David, to Webb, Norma J. Smoke detector. 4,257,039, Cl. 340-629.000.

Webster, Frank G.; and Regan, Michael T., to Eastman Kodak Company. Organic electrophotosensitive materials for migration imaging processes. 4,256,819, Cl. 430-41.000.

Weinicke, Martin: *See—*
Petrak, Heinz; Vieweg, Gunther; and Weinicke, Martin, 4,256,352, Cl. 308-10.000.

Weinlich, Jurgen: *See—*
Fischer, Edgar; Brandrup, Johannes; and Weinlich, Jurgen, 4,256,854, Cl. 525-242.000.

Weis, John A.: *See—*
Horton, James A.; and Weis, John A., 4,256,962, Cl. 250-281.000.

Weiss, Franz-Josef: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Weiss, Franz-Josef; and Lemann, Otto, 4,256,909, Cl. 560-204.000.

Welling, John R.: *See*—
Norris, Dean E.; and Welling, John R., 4,255,938, Cl. 62-268.000.

Wendt, Alan C., to United States Gypsum Company. Accessible partition assembly. 4,255,910, Cl. 52-481.000.

Wentzell, Edward S. Method of preparing pop bumpers of a pin ball game for field replacement of ball wearable parts. 4,255,844, Cl. 29-401.100.

Werner, Rolf G.: *See*—
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.

Wescom Switching, Inc.: *See*—
Pitroda, Satyan G.; Fechalos, William A.; and Stehman, Carl J., 4,256,926, Cl. 179-18.0ES.
Pitroda, Satyan G., 4,257,119, Cl. 370-58.000.

Wessel, Gerhard; Pottharst, Jurgen; and Koger, Kurt, to International Standard Electric Corporation. Electro-optical display. 4,256,383, Cl. 350-343.000.

Western Electric Company, Inc.: *See*—
Banks, Edward L., 4,256,535, Cl. 156-645.000.
Fortuna, Joseph J., 4,255,851, Cl. 29-827.000.

Westin, Rolf B.: *See*—
Roy, Ram B.; Ostehsson, Lars B.; and Westin, Rolf B., 4,256,808, Cl. 428-421.000.

Westinghouse Electric Corp.: *See*—
Cannady, Daniel L., Jr.; and Palazzolo, Salvatore E., 4,256,793, Cl. 428-137.000.
Down, Michael G., 4,255,963, Cl. 73-19.000.
Loch, Emil; and Mendolia, Frank J., 4,255,840, Cl. 29-157.00R.
Miller, Robert C., 4,257,004, Cl. 324-141.000.
Morton, Edward W., 4,256,993, Cl. 315-106.000.
Prines, Frank J.; Matty, Thomas C.; and Franz, James H., 4,257,092, Cl. 363-124.000.

Wettstein, Peter: *See*—
Fluri, Peter; Voser, Richard; and Wettstein, Peter, 4,256,837, Cl. 435-167.000.

Wetzel, Bernd: *See*—
Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, 4,256,738, Cl. 424-180.000.

Wheeler, Thomas N., to Union Carbide Corporation. Method of preparing 2-aryl-1,3-cyclohexanedione compounds. 4,256,657, Cl. 260-465.00D.

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White, Ruth. Vaginal cleansing apparatus. 4,256,107, Cl. 128-251.000.

Whitlock, Richard D. Toggle switch actuating apparatus. 4,256,943, Cl. 200-331.000.

Whitney, Craig B.: *See*—
Smith, James B.; and Whitney, Craig B., 4,256,130, Cl. 137-1.000.

Whitt, Jerry C.: *See*—
Black, Sigmund; Lagowski, Joseph V.; Whitt, Jerry C.; and Plumley, Roger D., 4,256,343, Cl. 299-31.000.

Whitty, Parnell, to R. T. French Co., The. Brick finishing machine. 4,256,078, Cl. 125-3.000.

Wichterle, Otto, to SPOFA, spojene podniky pro zdravotnichou. Toric hydrogel contact lens. 4,256,369, Cl. 350-160.00H.

Wickmann-Werke Boblingen GmbH: *See*—
Efinger, Arnold; and Moser, Erwin, 4,256,938, Cl. 200-144.00B.

Wideman, Lawson G.: *See*—
Frech, Kenneth J.; and Wideman, Lawson G., 4,256,880, Cl. 544-106.000.

Widener, G. Paul. Multi-tone percussion instrument. 4,256,006, Cl. 84-411.00R.

Wied, Julius P., to Lucerne Products, Inc. Trigger operated tool handle switch. 4,256,942, Cl. 200-157.000.

Wierenga, Wendell: *See*—
Kelly, Robert C.; and Wierenga, Wendell, 4,256,898, Cl. 548-240.000.

Wiersma, Tjeerd G., to Smit Ovens Nijmegen BV. Lifting plate furnace. 4,256,454, Cl. 432-241.000.

Wiesenberger, Alois: *See*—
Kranz, Joachim; Polster, Rudolf; Sappok, Reinhard; and Wiesenberger, Alois, 4,256,507, Cl. 106-288.00Q.

Wildgruber, Georg. Electrically heated animal waterer. 4,256,950, Cl. 219-306.000.

Wilkes, Colin: *See*—
Johnson, Robert H.; and Wilkes, Colin, 4,255,927, Cl. 60-39.230.

Wilkin, Geoffrey A.: *See*—
Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., 4,255,966, Cl. 73-81.000.

Wilkinson, John R., to Bendix Corporation, The. Feedback-compensated ramp-type analog to digital converter. 4,257,034, Cl. 340-347.0NT.

Williams, Bruce E.: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,256,761, Cl. 424-282.000.

Williams, Earl D. Apparatus for unattended conversion of a front end loader. 4,255,884, Cl. 37-117.500.

Williams, Edward: *See*—
Edwards, Michael F.; and Williams, Edward, 4,256,349, Cl. 301-13.0SM.

Williams, Eugene, Sr. Audiovisual interview portfolio. 4,255,872, Cl. 434-308.000.

Williams, George J.: *See*—
Boyer, Robert C.; and Williams, George J., 4,255,841, Cl. 29-157.400.

Williams, Haydn W. R.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,256,758, Cl. 424-274.000.

Williams, James H. Method and apparatus for marking tires. 4,256,159, Cl. 152-353.00R.

Willis, Robert E. Orthopedic apparatus for protecting and supporting a bone joint. 4,256,097, Cl. 128-80.00C.

Wilmes, Manfred: *See*—
Obst, Rudiger; Wilmes, Manfred; and Murray, Peter E., 4,255,838, Cl. 24-255.0BS.

Wilson, Albert H.: *See*—
Narozny, Ronald S.; and Wilson, Albert H., 4,257,028, Cl. 339-126.00R.

Wilson, Charles P. Firebox. 4,256,083, Cl. 126-121.000.

Wilson, Eugene M.: *See*—
Mitchell, Roger R.; Trayler, Robert J.; and Wilson, Eugene M., 4,255,885, Cl. 37-126.0AE.

Wilson, G. Kevin. Detachable pump handle for liquid fuel appliances. 4,255,830, Cl. 16-114.00R.

Wilson, John F.; and Towler, Brian, to Rolls Royce Limited. Electrochemical-machining of aerofoil blades. 4,256,555, Cl. 204-129.500.

Winans, Vida: *See*—
Jackson, Denise M.; Tsuda, Yoshihisa; and Winans, Vida, 4,256,838, Cl. 435-234.000.

Winnale, James A., to General Motors Corporation. Child restraint for passive restraint system. 4,256,329, Cl. 280-802.000.

Winter, Richard D. Toboggan. 4,256,319, Cl. 280-18.000.

Winters, Thomas B.; and Friday, Jim H., to Societe d'Assistance Technique pour Produits Nestle S.A. Apparatus for ejecting objects from a conveyor line. 4,256,216, Cl. 198-488.000.

Wischer, Hermann: *See*—
Sommer, Rudiger; and Wischer, Hermann, 4,257,070, Cl. 358-282.000.

Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, to International Flavors & Fragrances Inc. Flavoring with certain 2-alkyl-4,5-dialkyl-Δ^3-thiazolines. 4,256,776, Cl. 426-535.000.

Witt, Alvin E.; and Bosco, Lewis R., to PermaGrain Products, Inc. Moisture-resistant fire-retardant decorative floor and wall coverings and process for the manufacture thereof. 4,256,798, Cl. 428-215.000.

Wittmann, Erwin; Diskus, Alfred; and Auer, Engelbert, to Chemie Linz Aktiengesellschaft. Herbicidal composition. 4,256,482, Cl. 71-92.000.

Witzke, Horst; and Pollock, James W., to Refac Electronics Corporation. Simultaneous color and bleach of ECD. 4,257,046, Cl. 340-785.000.

Woinarski, Peter A., to Innovative Design Company Pty. Limited. Container closure. 4,256,240, Cl. 220-306.000.

Woitun, Eberhard; Wetzel, Bernd; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; Werner, Rolf G.; and Goeth, Hanns, to Boehringer Ingelheim GmbH. 9-(ω-Heteroarylamino-alkylamino)-erythromycins and salts thereof. 4,256,738, Cl. 424-180.000.

Wojcik, Bruce C.: *See*—
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,256,553, Cl. 204-106.000.

Wolf, Peter H.; and Slade, Boyd E., to Dataproducts Corporation. Integral beaded stylus wire and method of making same. 4,256,948, Cl. 219-121.0LE.

Wolsky, Alfred A.; Papp, Richard B.; and Victor, James G., to Atlantic Richfield Company. Removal of soluble tellurium or compounds thereof from a crude glycol ester solution. 4,256,912, Cl. 560-248.000.

Woma-Apparatebau: *See*—
Huperz, Adalbert; and Maasberg, Wolfgang, 4,256,139, Cl. 137-512.300.

Woo, Edmund P., to Dow Chemical Company, The. Substituted crown polyethers. 4,256,859, Cl. 525-384.000.

Woodlief, Frederick E.; and DeAmicis, Gene E., to Square D Company. Electromagnetic contactor arc chute. 4,256,937, Cl. 200-144.00R.

Woodward, Robert B.; and Bickel, Hans, to Ciba-Geigy Corporation. 7β-Amino-3-thio-3-cephem-4-carboxylic acid compounds, and antibacterial compositions and methods using them. 4,256,739, Cl 424-200.000.

Worldwide Converting Machinery, Inc.: *See*—
Lee, Frank X.; and Krimsky, Leonard C., 4,256,270, Cl. 242-75.500.

Wright, Roy F.: *See*—
Naylor, Floyd E.; and Wright, Roy F., 4,256,853, Cl. 525-92.000.

Wright, Thomas J.: *See*—
Zelazo, Ted S.; and Wright, Thomas J., 4,257,026, Cl. 336-90.000.

Wroblewski, Richard E.: *See*—
Burgess, Leonard G.; and Wroblewski, Richard E., 4,256,425, Cl. 410-149.000.

Wulfing, Johann A.: *See*—
Goring, Joachim E.; and Ochlich, Peter P., 4,256,750, Cl. 424-253.000.
Wurlitzer Company, The: *See*—
Schwartz, Harold O.; and Hoskinson, William R., 4,256,002, Cl. 84-1.010.
Wyatt, Michael A.; and Beckwith, Robert W., to Beckwith Electric Co., Inc. Power transfer relay circuitry and method of phase measurement. 4,256,972, Cl. 307-68.000.
Wysocki, Steve S.; Nelson, Norman E.; and Vogelgesang, Peter J., to Minnesota Mining and Manufacturing Company. Tape magazine and recording and/or playback machine with improved magazine locating and loading structure. 4,257,075, Cl. 360-96.500.
Xerox Corporation: *See*—
Blossey, Daniel F.; Erhardt, Peter F.; Dickerson, Charles G.; Sypula, Donald S.; Kuder, James E.; and Swigert, J. Kirk, 4,256,818, Cl. 430-39.000.
Kramer, Charles J., Jr.; and Seachman, Ned J., 4,257,016, Cl. 332-7.510.
Lu, Chin H., 4,256,824, Cl. 430-122.000.
Yakshina, Olga K.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.
Yamaguchi, Kenichi: *See*—
Ito, Katsuo; Murata, Bunjiro; Yoshimura, Kazunori; and Yamaguchi, Kenichi, 4,256,935, Cl. 200-51.00R.
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, to Tokan Kogyo Kabushiki Kaisha. Easily openable cover member. 4,256,239, Cl. 220-270.000.
Yamaguchi, Tsuneo; and Harashima, Kiyoshi, to Elecompack Company Ltd. Locking and unlocking device for manually movable wheeled storage rack or the like. 4,256,355, Cl. 312-198.000.
Yamaha Hatsudori Kabushiri Kaisha: *See*—
Masuda, Yutaka; and Ota, Seisaku, 4,256,069, Cl. 123-196.00S.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Automatic transmission with governor driving arrangement. 4,255,983, Cl. 74-752.00C.
Yamamoto, Masaji; Shioi, Keiko; and Murakami, Kimio, to Sakura Color Products Corp. Erasable ink composition for writing on an impervious surface. 4,256,494, Cl. 106-22.000.
Yamamoto, Ryuichi; and Torri, Masaaki, to Mitsui Toatsu Chemicals, Inc. Process for the preparation of phosphoric esters and thiophosphoric esters. 4,256,672, Cl. 260-974.000.
Yamamoto, Satoshi; Hirae, Toshiyuki; and Koizumi, Yasunori, to Mitsubishi Petrochemical Co., Ltd.; and Yukamelamin Company, Limited. Lubricant, lubricant composition and method for lubricating a surface. 4,256,591, Cl. 252-12.000.
Yamamoto, Takashi: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.
Yamamoto, Takeshi: *See*—
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,256,604, Cl. 252-188.30R.
Yamamoto, Tatsuo: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.
Yamashita, Masayoshi: *See*—
Nishimura, Kenji; Furusaki, Shinichi; Shiomi, Yasushi; Fujii, Kozo; Nishihira, Keigo; and Yamashita, Masayoshi, 4,256,908, Cl. 560-204.000.
Yamashita, Shigeo: *See*—
Nakamura, Michiharu; Yamashita, Shigeo; Kuroda, Takao; and Umeda, Jun-ichi, 4,257,011, Cl. 331-94.50H.
Yamaya, Nobuyuki: *See*—
Takayanagi, Yoshikazu; Iizumi, Katsuo; Miyazawa, Masashi; Yamaya, Nobuyuki; and Tamura, Hajime, 4,256,917, Cl. 562-562.000.
Yamazaki, Hayao: *See*—
Tsujimoto, Susumu; Yamazaki, Hayao; Ozaki, Masayoshi; and Kobayashi, Takehiro, 4,256,127, Cl. 132-9.000.
Yanai, Tokiyoshi, to Nissan Motor Company, Limited. Variable ratio steering gear. 4,255,980, Cl. 74-388.0PS.
Yao, Shi-Kay: *See*—
Soohoo, Jack E.; McNutt, Michael J.; Yao, Shi-Kay; Hayes, Cecil L.; and Gudmundsen, Richard A., 4,257,111, Cl. 365-114.000.
Yasuda, Takao: *See*—
Nogi, Teiji; and Yasuda, Takao, 4,256,934, Cl. 200-48.00R.
Yasuhisa, Saburo, to Shimoda Electric Company. Transformer bobbin assembly. 4,257,027, Cl. 336-192.000.
Yasukuni, Mitsuo; Kiten, Hiroshi; Iida, Takashi; Kawamura, Kunio; and Yoshida, Nobuo, to Minolta Camera Kabushiki Kaisha. Catadioptric lens system with light transmission control means. 4,256,372, Cl. 350-444.000.
Yazaki, Katsuya; Inoue, Takashi; and Mori, Shohji, to Nippon Petrochemicals Co., Ltd. Process for producing molded articles. 4,256,687, Cl. 264-210.100.
Yeda Research and Development Co. Ltd.: *See*—
Avigal, Yitzhak; Cahen, David; Hodes, Gary; and Manassen, Joost, 4,256,814, Cl. 429-111.000.
Levin, Yehuda; and Sela, Ben-Ami, 4,256,632, Cl. 260-112.50R.
Yen, Anderson. Alarm circuit for generating syllable-pause alarm codes. 4,257,035, Cl. 340-384.00E.
Yokoi, Hiroshi; and Shiokawa, Takayasu, to Kokusai Denshin Denwa Kabushiki Kaisha. Antenna system to reduce fading caused by multipath transmission. 4,257,048, Cl. 343-709.000.
Yokoo, Nobuo; and Mori, Toshihito, to Kowa Company, Limited. Process for the preparation of immunoglobulin for intravenous administration. 4,256,631, Cl. 260-112.00B.
Yokoyama, Masao: *See*—
Niinobe, Takao; Yoshida, Kokichi; and Yokoyama, Masao, 4,256,550, Cl. 204-72.000.
Yokoyama, Sigeaki; Toyoda, Tsunehiko; and Okamura, Noriaki, to Dai Nippon Tokyo Co., Ltd. Jet ink composition. 4,256,493, Cl. 106-22.000.
Yokoyama, Tatsuro: *See*—
Kojima, Atsushi; Kohno, Yoshitsugu; Ike, Yoshimasa; Yokoyama, Tatsuro; and Odate, Makoto, 4,256,885, Cl. 544-313.000.
Yoneda, Naoto: *See*—
Hayashi, Kimiaki; Kato, Jyoji; Uchida, Tomofumi; and Yoneda, Naoto, 4,256,751, Cl. 424-258.000.
Yool, George M., to Ma-West, Inc. Wide range frequency counter. 4,257,003, Cl. 324-78.00D.
Yorkanis, Bernard J., to RCA Corporation. Inhibit circuit for a differential amplifier. 4,257,009, Cl. 330-51.000.
Yoshibayashi, Shigeru: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; Shimosakoda, Akio; and Tanaka, Shigeho, 4,255,978, Cl. 73-577.000.
Yoshida, Etuji, to Kao Soap Co., Ltd. Apparatus for heating and cooling sand. 4,256,174, Cl. 165-.27..
Yoshida, Katsuyoshi; Higashi, Mitsuo; Kanamaru, Tatsuya; and Nakayama, Motohiro, to Nippon Steel Corporation. Method for heat treatment of low melting point-metal plated steel band. 4,256,519, Cl. 148-156.000.
Yoshida, Kokichi: *See*—
Niinobe, Takao; Yoshida, Kokichi; and Yokoyama, Masao, 4,256,550, Cl. 204-72.000.
Yoshida, Manabu; Fukuchi, Jun; and Takayanagi, Shigetoshi, to Matsushita Electric Industrial Co., Ltd. Photoelectric conversion device. 4,256,513, Cl. 136-256.000.
Yoshida, Masako: *See*—
Ohashi, Takashi; Okuyama, Toru; Kaneda, Hiroshi; Taniguchi, Yoshiko; and Yoshida, Masako, 4,256,846, Cl. 521-117.000.
Yoshida, Masatoshi; and Hirai, Minoru, to Toho Beslon Co., Ltd. Process for production of activated carbon fibers. 4,256,607, Cl. 252-117.000.
Yoshida, Nobuo: *See*—
Yasukuni, Mitsuo; Kiten, Hiroshi; Iida, Takashi; Kawamura, Kunio; and Yoshida, Nobuo, 4,256,372, Cl. 350-444.000.
Yoshida, Ryo: *See*—
Asao, Shuichiro; Nakayama, Yoshinori; Yoshida, Ryo; Sumida, Seizo; and Hashimoto, Shunichi, 4,256,483, Cl. 71-92.000.
Yoshida, Takashi: *See*—
Noguchi, Yasuhiro; Sakaguchi, Shinji; and Yoshida, Takashi, 4,256,827, Cl. 430-215.000.
Yoshikawa, Syuich: *See*—
Suzuki, Kazuo; Koda, Hirokazu; Nakamura, Kenichi; Yoshikawa, Syuich; and Ohara, Naoki, 4,256,047, Cl. 112-158.00E.
Yoshikawa, Tsukasa: *See*—
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, 4,256,239, Cl. 220-270.000.
Yoshimura, Kazunori: *See*—
Ito, Katsuo; Murata, Bunjiro; Yoshimura, Kazunori; and Yamaguchi, Kenichi, 4,256,935, Cl. 200-51.00R.
Yoshino Kogyosho Co., Ltd.: *See*—
Suzuki, Sadao; Akutsu, Masao; and Ota, Akiho, 4,256,789, Cl. 428-35.000.
Yoshioka, Keiichi; Kinoshita, Noboru; Ono, Yutaka; and Ohashi, Nobuo, to Kawasaki Steel Corporation. Martensitic stainless steel having excellent weldability and workability for structural use. 4,256,486, Cl. 75-125.000.
Yoshizaki, Shiro: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,256,890, Cl. 546-158.000.
Yoshizawa, Keiichi, to TDK Electronics Co., Ltd. Apparatus for rewinding magnetic tape in video cassette. 4,257,079, Cl. 360-137.000.
Youngdale, Gilbert A., to Upjohn Company, The. 2a,2b-Dihomo-15-alkyl-PGF$_{1\beta}$ compounds. 4,256,651, Cl. 260-410.90R.
Yu, Kin C.: *See*—
Holtey, Thomas O.; and Yu, Kin C., 4,257,101, Cl. 364-200.000.
Yuasa Battery Company Limited: *See*—
Tamura, Kazuhiro; and Ninomiya, Saburo, 4,256,812, Cl. 429-56.000.
Yukamelamin Company, Limited: *See*—
Yamamoto, Satoshi; Hirae, Toshiyuki; and Koizumi, Yasunori, 4,256,591, Cl. 252-12.000.
Yushina, Yoshinori: *See*—
Shimodaira, Chiaki; Yushina, Yoshinori; Kamata, Hiroshi; Komatsu, Hideo; Kurima, Akinori; Mabu, Osamu; and Tanaka, Yoshiharu, 4,256,573, Cl. 210-618.000.
Zacharias, Theodor, to Kocks Technik GmbH & Co. Rolling mill sizing apparatus. 4,255,956, Cl. 72-225.000.
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.;

and Tkach, Grigory A. Composition for diffusion coating of ferrous metals. 4,256,490, Cl. 106-1.120.

(Zaidanhojin) Sagami Chemical Research Center: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Mori, Kaoru; Ichikawa, Tetsuya; Nonaka, Yuji; Kihara, Keiichi; Oyama, Kiyotaka; Satoh, Heijiro; and Nishimura, Shigeaki, 4,256,836, Cl. 435-70.000.

Zaitsev, Ivan D.: *See*—
Zaets, Inna I.; Zaitsev, Ivan D.; Yakshina, Olga K.; Pershina, Nina F.; Gorbachev, Anatoly K.; Gladky, Ivan N.; Davydenko, Nikolai M.; and Tkach, Grigory A., 4,256,490, Cl. 106-1.120.

Zajicek, Otmar; Kirschner, Jurgen; Klapp, Helmut; and Rompeltien, Rainer, to Wacker-Chemie GmbH. Process for the destruction of foam. 4,256,470, Cl. 55-48.000.

Zally, William J.: *See*—
Field, George F.; and Zally, William J., 4,256,637, Cl. 260-239.0BD.

Zann, Annie: *See*—
Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, 4,256,656, Cl. 260-465.00D.

Zannucci, Joseph S.: *See*—
Wang, Richard H. S.; and Zannucci, Joseph S., 4,256,626, Cl. 260-45.80N.

Zaromb, Solomon: *See*—
Salvano, Lori, 4,256,046, Cl. 111-1.000.

Zeeh, Bernd: *See*—
Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, 4,256,754, Cl. 424-269.000.

Zeek, Richard M., to General Motors Corporation. Regenerator seal hub gas passages. 4,256,171, Cl. 165-7.000.

Zeewy, Abraham: *See*—
Loughry, H. Hampton; and Zeewy, Abraham, 4,257,063, Cl. 358-108.000.

Zelazo, Ted S.; and Wright, Thomas J., to Bel-Tronics Corporation. Adjustable linearity coil assembly. 4,257,026, Cl. 336-90.000.

Zengel, Hans: *See*—
Schulze, Helmut; Zengel, Hans; Brodowski, Walter; Huntjens, Franciscus J.; Schutijser, Jan A. J.; and Hentschel, Peter, 4,256,869, Cl. 528-67.000.

Zickendraht, Christian: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,256,896, Cl. 548-160.000.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; and Zoleski, Benjamin H., 4,256,595, Cl. 252-51.50A.

Zoli, Theodore P., Jr.: *See*—
Formato, Richard A., 4,255,976, Cl. 73-861.080.

Zuk, Robert F.; and Ullman, Edwin F., to Syva Company. Fluorescent scavenger particle immunoassay. 4,256,834, Cl. 435-7.000.

Zweigle, Maurice L.; and Hickman, Janet C., to Dow Chemical Company, The. Hot melt compositions. 4,256,505, Cl. 106-171.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF MARCH, 1981

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Belden, Ralph A., to Professional Management Associates. Bicycle with a pivotable rear wheel. Re. 30,547, Cl. 280-240.000.

Brown, Marvin R.: *See*—
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., Re. 30,548, Cl. 260-8.000.

Professional Management Associates: *See*—
Belden, Ralph A., Re. 30,547, Cl. 280-240.000.

Rivier, Jean E. F.: *See*—
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., Re. 30,548, Cl. 260-8.000.

Salk Institute for Biological Studies, The: *See*—
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., Re. 30,548, Cl. 260-8.000.

Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., to Salk Institute for Biological Studies, The. Peptides which effect release of hormones. Re. 30,548, Cl. 260-8.000.

LIST OF DESIGN PATENTEES

Abboud, Sobhi J. Boat. 258,581, 3-17-81, Cl. D12-62.000.

Amba Marketing Systems, Inc.: *See*—
Siegel, Milton I., 258,551, Cl. D3-52.000.

American Cyanamid Co.: *See*—
Grip, John A., 258,568, Cl. D9-412.000.
Grip, John A., 258,569, Cl. D9-377.000.
Grodin, Adam J., 258,574, Cl. D9-432.000.

Anchor Hocking Corporation: *See*—
O'Toole, David M., 258,567, Cl. D9-385.000.
Pettengill, Floyd E., 258,570, Cl. D9-385.000.
Potter, Jerald E., 258,566, Cl. D9-385.000.

Andersson, Lars M., to HAFA Fabriks AB. Bathroom cabinet. 258,554, 3-17-81, Cl. D6-104.000.

Atlas Products, Inc.: *See*—
Wyckoff, Frank K.; and Silver, Roger C., 258,591, Cl. D15-20.000.

Barrett, Edward J. Molecular model. 258,597, 3-17-81, Cl. D19-62.000.

Baturin, Peter, to Medical Products Institute Incorporated. Vacuum splint. 258,611, 3-17-81, Cl. D24-64.000.

Baturin, Peter, to Medical Products Institute Incorporated. Vacuum splint. 258,612, 3-17-81, Cl. D24-64.000.

Billy Goat Industries, Inc.: *See*—
Rubin, Robert M., 258,593, Cl. D15-53.000.

Bottner, Alfred I., to GTE Products Corporation. Signalling device. 258,577, 3-17-81, Cl. D10-106.000.

Bulgari, Marina, to Zoldia Anstalt. Necklace. 258,580, 3-17-81, Cl. D11-5.000.

Capitol Products Corporation: *See*—
Cribben, James T.; and Feeser, Richard A., 258,618, Cl. D25-74.000.

Case, Evelyn G. Casing for an electronic dice game or the like. 258,600, 3-17-81, Cl. D21-41.000.

Chiarella, Philip V., to Les Produits Sportifs Micron Inc. - Micron Sports Products Inc. Skate boot or the like. 258,545, 3-17-81, Cl. D2-275.000.

Coburn, C. David: *See*—
Maloy, Rex M.; and Coburn, C. David, 258,598, Cl. D20-9.000.

Coburn, Orin W.: *See*—
Maloy, Rex M.; and Coburn, C. David, 258,598, Cl. D20-9.000.

Cribben, James T.; and Feeser, Richard A., to Capitol Products Corporation. Swimming pool coping member or similar article. 258,618, 3-17-81, Cl. D25-74.000.

Dallaire, Raymond. Handle for sliding door or window. 258,561, 3-17-81, Cl. D8-300.000.

Dallaire, Raymond. Window component extrusion. 258,614, 3-17-81, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 258,615, 3-17-81, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 258,616, 3-17-81, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 258,617, 3-17-81, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 258,619, 3-17-81, Cl. D25-74.000.

Deschamps, Robert L.: *See*—
Kehl, Joseph D.; and Deschamps, Robert L., 258,586, Cl. D14-29.000.

DeStepheno, George E., to Le Van Specialty Co., Inc. Removable hinge retainer for vehicle sun roofs. 258,562, 3-17-81, Cl. D8-323.000.

Dumont Handkerchiefs, Inc.: *See*—
Kaplan, Will, 258,572, Cl. D9-307.000.

du Plooy, Barend J., to Shell South Africa (Proprietary) Ltd. Solar water heater. 258,608, 3-17-81, Cl. D23-86.000.

Ethyl Corporation: *See*—
Hayes, Thomas H., 258,564, Cl. D9-383.000.

Evjen, Trygve; Gulbrandsen, Bjorn; Halvorsen, Magne; and Sandsten, Bjorn E., to Trygve Liljedahl Skistavfabrikk A/S. Basket for a ski pole or similar article. 258,606, 3-17-81, Cl. D21-230.000.

Famolare, Inc.: *See*—
Famolare, Joseph P., Jr., 258,546, Cl. D2-309.000.
Famolare, Joseph P., Jr., 258,547, Cl. D2-309.000.
Famolare, Joseph P., Jr., 258,548, Cl. D2-309.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe upper. 258,546, 3-17-81, Cl. D2-309.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe upper. 258,547, 3-17-81, Cl. D2-309.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe upper. 258,548, 3-17-81, Cl. D2-309.000.

Feeser, Richard A.: *See*—
Cribben, James T.; and Feeser, Richard A., 258,618, Cl. D25-74.000.

Freedman, Mark H., to Freedman, Mark H.; and Freedman, Theodore M. Flour sifter or the like. 258,558, 3-17-81, Cl. D7-47.000.

Freedman, Theodore M.: *See*—
Freedman, Mark H., 258,558, Cl. D7-47.000.

General Electric Company: *See*—
Kolwaite, John S., 258,587, Cl. D14-73.000.

Goldman, Paul R. Shoe heel. 258,549, 3-17-81, Cl. D2-323.000.

Green, Kathryn S., to Xerox Corporation. Font of type. 258,595, 3-17-81, Cl. D18-24.000.

Grip, John A., to American Cyanamid Co. Bottle or similar article. 258,568, 3-17-81, Cl. D9-412.000.

Grip, John A., to American Cyanamid Co. Bottle and cap or similar article. 258,569, 3-17-81, Cl. D9-377.000.

Grodin, Adam J., to American Cyanamid Co. Carton. 258,574, 3-17-81, Cl. D9-432.000.

GTE Products Corporation: *See*—
Bottner, Alfred I., 258,577, Cl. D10-106.000.

Gulbrandsen, Bjorn: *See*—
Evjen, Trygve; Gulbrandsen, Bjorn; Halvorsen, Magne; and Sandsten, Bjorn E., 258,606, Cl. D21-230.000.

HAFA Fabriks AB: *See*—
Andersson, Lars M., 258,554, Cl. D6-104.000.

Halvorsen, Magne: *See*—
Evjen, Trygve; Gulbrandsen, Bjorn; Halvorsen, Magne; and Sandsten, Bjorn E., 258,606, Cl. D21-230.000.

Hayes, Thomas H., to Ethyl Corporation. Bottle or similar article. 258,564, 3-17-81, Cl. D9-383.000.

Herr, Nicholas G., to Xenika, Inc. Anatomically correct head support. 258,557, 3-17-81, Cl. D6-201.000.

Hirtle, Clayton N. Bottle. 258,571, 3-17-81, Cl. D9-401.000.

Hodges, Henry T.; Nall, Robert W.; and Sestito, William F., to Mattell, Inc. Game board or similar article. 258,599, 3-17-81, Cl. D21-17.000.

Holstine, Patricia I. Mountain lion figure. 258,602, 3-17-81, Cl. D21-148.000.

Holstine, Patricia I. Koala bear figure. 258,603, 3-17-81, Cl. D21-159.000.

Jonas, Gerald L. Airplane. 258,583, 3-17-81, Cl. D12-78.000.

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Smith, Ernest L., 258,576, Cl. D9-452.000.
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Wilkof, Ervin: *See*—
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147 R 4,256,939
148 R 4,256,940
153 SC 4,256,941
157 4,256,942
331 4,256,943

CLASS 201

9 4,256,539

CLASS 202

139 4,256,540

CLASS 203

19 4,256,541

CLASS 204

1 T 4,256,542
4,256,543
2.1 4,256,544
33 4,256,546
35 N 4,256,547
43 R 4,256,548
60 4,256,549
72 4,256,550
98 4,256,551
4,256,552
106 4,256,553
128 4,256,554
129.5 4,256,555
147 4,256,556
149 4,256,557
159.15 4,256,558
180 P 4,256,559
181 C 4,256,560
195 M 4,256,561
258 4,256,562
290 F 4,256,563
290 R 4,256,545

CLASS 206

45.11 4,256,223
203 4,256,224
303 4,256,225
427 4,256,226

CLASS 208

120 4,256,564
129 4,256,565
139 4,256,566
252 4,256,567
263 4,256,568

CLASS 209

3.3 4,256,569
5 4,256,570
4,256,571
166 4,256,227
257 4,256,572
600 4,256,228

CLASS 210

90 4,256,579
151 4,256,580
173 4,256,581
297 4,256,582
333.1 4,256,583
446 4,256,584
474 4,256,585
487 4,256,586
614 4,256,574
618 4,256,573
629 4,256,575
670 4,256,587
692 4,256,588
738 4,256,577
766 4,256,578

CLASS 211

41 4,256,229

CLASS 212

216 4,256,230

CLASS 215

1 C 4,256,231
12 R 4,256,232
254 4,256,233
343 4,256,234

CLASS 219

10.55 F 4,256,944
10.75 4,256,945
78.15 4,256,946
79 4,256,947
121 LE 4,256,948
146.24 4,256,949
306 4,256,950
492 4,256,951
521 4,256,952

CLASS 220

4 F 4,256,235
6 4,256,236
270 4,256,239
306 4,256,240

CLASS 221

26 4,256,237
263 4,256,238

CLASS 222

85 4,256,241
207 4,256,242

CLASS 224

244 4,256,243
252 4,256,244
273 4,256,245

CLASS 225

103 4,256,246

CLASS 226

45 4,256,247
118 4,256,248
181 4,256,249

CLASS 227

17 4,256,250
120 4,256,251

CLASS 228

1 A 4,256,252
112 4,256,253
166 4,256,254
175 4,256,255

CLASS 229

56 4,256,256

CLASS 235

92 SH 4,256,954
92 T 4,256,953
380 4,256,955
449 4,256,956

CLASS 236

1 G 4,256,257
94 4,256,258

CLASS 238

160 4,256,259

CLASS 239

119 4,256,260
155 4,256,261
276 4,256,262
487 4,256,263

CLASS 241

20 4,256,266
24 4,256,267
72 4,256,264
92 4,256,265

CLASS 242

7.11 4,256,268
18 PW 4,256,272
66 4,256,269
75.5 4,256,270
84.2 G 4,256,271
107.4 R 4,256,273
201 4,256,274

CLASS 244

3.19 4,256,275
118.1 4,256,276
213 4,256,277

CLASS 246

247 4,256,278

CLASS 248

184 4,256,279
220.2 4,256,280
231 4,256,281

CLASS 250

223 B 4,256,957
233 4,256,958
235 4,256,959
252 4,256,960
272 4,256,961
281 4,256,962
296 4,256,963
345 4,256,964
367 4,256,965
491 4,256,966
544 4,256,967
560 4,256,968
566 4,256,969

CLASS 251

58 4,256,282
62 4,256,283
126 4,256,284
283 4,256,285

CLASS 252

8.55 D 4,256,590
8.7 4,256,589
12 4,256,591
46.7 4,256,592
49.8 4,256,593
49.9 4,256,594
51.5 A 4,256,595
52 R 4,256,596
99 4,256,597
4,256,598
4,256,599
117 4,256,607
132 4,256,600
135 4,256,601
142 4,256,602
182 4,256,603
188.3 R 4,256,604
312 4,256,605
411 R 4,256,606
441 4,256,608
455 Z 4,256,609
542 4,256,610
548 4,256,611

CLASS 254

30 4,256,286

CLASS 256

59 4,256,287

CLASS 260

2.3 4,256,612
8 Re.30,548
13 4,256,613
17 A 4,256,614
18 S 4,256,616
18 TN 4,256,615
4,256,617
23 XA 4,256,618
23.7 C 4,256,619
29.6 HN 4,256,620
29.7 NR 4,256,621
33.2 R 4,256,622
38 4,256,623
40 R 4,256,624
4,256,625
45.75 N 4,256,627
45.8 N 4,256,626
97.7 4,256,628
112 B 4,256,629
4,256,631
112 R 4,256,630
112.5 R 4,256,632
145 C 4,256,633
149 4,256,634
156 4,256,635
192 4,256,636
239 BD 4,256,637
245.3 4,256,638
325 R 4,256,639
326.12 A 4,256,640
326.14 T 4,256,641
340.3 4,256,642
340.7 4,256,643
340.9 R 4,256,644
343.5 4,256,645
345.8 P 4,256,646
346.22 4,256,647
4,256,648
348.33 4,256,649
4,256,650
410.9 R 4,256,651
429 R 4,256,652
449.6 M 4,256,653
449.6 R 4,256,654
453 RW 4,256,655
465 D 4,256,656
4,256,657
4,256,658
4,256,659
513 N 4,256,660
974 4,256,672

CLASS 261

94 4,256,673
112 4,256,674
128 4,256,675

CLASS 264

0.5 4,256,676
8 4,256,677
40.1 4,256,678
51 4,256,679
71 4,256,680
85 4,256,681
109 4,256,682
157 4,256,683
167 4,256,685
168 4,256,684
209 4,256,686
210.1 4,256,687
325 4,256,688
328.8 4,256,689
504 4,256,690

CLASS 266

70 4,256,288
159 4,256,289
191 4,256,290
272 4,256,291

CLASS 267

8 R 4,256,292
123 4,256,293

CLASS 269

16 4,256,294
45 4,256,295
4,256,296

CLASS 271

207 4,256,297
245 4,256,298
262 4,256,299

CLASS 272

85 4,256,300
118 4,256,302
123 4,256,301

CLASS 273

29 A 4,256,303
60 B 4,256,304
64 4,256,305
85 R 4,256,306
118 A 4,256,307
177 A 4,256,308
258 4,256,309

CLASS 277

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27 4,256,314
92 4,256,315
4,256,316
112 4,256,317
221 4,256,318

CLASS 280

18 4,256,319
37 4,256,320
204 4,256,321
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289 L 4,256,322
423 R 4,256,323
433 4,256,324
649 4,256,325
683 4,256,326
684 4,256,327
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4,256,329
4,256,330
804 4,256,331
4,256,332

CLASS 285

22 4,256,333
247 4,256,334
250 4,256,335

CLASS 290

53 4,256,970
4,256,971

CLASS 294

67 A 4,256,337
82 R 4,256,336
4,256,338

CLASS 296

1 S 4,256,339
24 R 4,256,340

CLASS 297

410 4,256,341

CLASS 299

7 4,256,342
31 4,256,343
39 4,256,344
43 4,256,345

CLASS 301

13 SM 4,256,349
64 R 4,256,348
64 SH 4,256,346
4,256,347

CLASS 303

6 M 4,256,350

CLASS 307

68 4,256,972
118 4,256,973
254 4,256,980
266 4,256,981
268 4,256,982
271 4,256,983
296 R 4,256,984
308 4,256,985
475 4,256,974
543 4,256,975
571 4,256,977
4,256,979
583 4,256,976
584 4,256,978

CLASS 308

8.2 4,256,351
10 4,256,352
26 4,256,353
139 4,256,354

CLASS 310

155 4,256,986
316 4,256,987

CLASS 312

198 4,256,355
320 4,256,356

CLASS 313

221 4,256,988
318 4,256,989

CLASS 315

39.61 4,256,990
104 4,256,991
106 4,256,992
4,256,993
151 4,256,994
241 P 4,256,995

CLASS 318

7 4,256,996
254 4,256,997
335 4,256,998
560 4,256,999
573 4,257,000

CLASS 324

58.5 C 4,257,001
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78 D 4,257,003
141 4,257,004
166 4,257,005

CLASS 328

127 4,257,006
167 4,257,007
206 4,257,008

CLASS 330

51 4,257,009

CLASS 331

65 4,257,010
94.5 D 4,257,012
4,257,015
94.5 H 4,257,011
94.5 P 4,257,013
94.5 PE 4,257,014

CLASS 332

7.51 4,257,016
4,257,017

CLASS 333

17 R 4,257,018
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195 4,257,021
201 4,257,022

CLASS 335

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213 4,257,024

CLASS 336

84 M 4,257,025
90 4,257,026
192 4,257,027

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97 C 4,256,359
97 R 4,256,360
126 R 4,257,028
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870.16 4,257,033

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709 4,257,048
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854 4,257,050

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75 4,257,052
108 4,257,053
155 4,257,054

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3.86 4,256,362
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6.9 4,256,364
96.18 4,256,365
97 4,256,366
135 4,256,367
160 H 4,256,369
289 4,256,375
310 4,256,378
334 4,256,382
336 4,256,376
340 4,256,377
343 4,256,383
357 4,256,379
4,256,380
408 4,256,368
423 4,256,371
4,256,381
440 4,256,370
444 4,256,372
463 4,256,373
472 4,256,374

CLASS 351

7 4,256,384
13 4,256,385
43 4,256,386
90 4,256,387
158 4,256,388

CLASS 352

11 4,256,389

CLASS 354

1 4,256,390
33 4,256,391
86 4,256,392
145 4,256,393
173 4,256,394
180 4,256,395
222 4,256,396
250 4,256,397
320 4,256,398

CLASS 355

8 4,256,399
14 E 4,256,401
14 SH 4,256,400

CLASS 356

38 4,256,402
73 4,256,403
316 4,256,404
346 4,256,405

CLASS 357

16 4,257,055
23 4,257,056
24 4,257,057
30 4,257,058
46 4,257,059
49 4,257,060
69 4,257,061

CLASS 358

81 4,257,062
108 4,257,063
169 4,257,064
172 4,257,065
183 4,257,066
189 4,257,067
242 4,257,068
261 4,257,069
282 4,257,070
286 4,257,071
298 4,257,072

CLASS 360

10 4,257,073
78 4,257,074
96.5 4,257,075
130.24 4,257,076
130.33 4,257,077
130.34 4,257,078
137 4,257,079

CLASS 361

19 4,257,080
156 4,257,081
191 4,257,082
234 4,257,083

CLASS 362

31 4,257,084
186 4,257,085
279 4,257,086

CLASS 363

16 4,257,087
18 4,257,088
25 4,257,089
65 4,257,090
85 4,257,091
124 4,257,092

CLASS 364

105 4,257,093
200 4,257,095
4,257,096
4,257,097
4,257,098
4,257,099
4,257,100
4,257,101
414 4,257,102
474 4,257,103
485 4,257,104
501 4,257,105
525 4,257,106
560 4,257,107
900 4,257,108

CLASS 365

11 4,257,109
49 4,257,110
114 4,257,111

CLASS 366

279 4,256,406
300 4,256,407

CLASS 368

11 4,257,112
35 4,257,113
62 4,257,114
69 4,257,115
4,257,116
4,257,117
276 4,257,118

CLASS 369

170 4,256,311
217 4,256,310
269 4,256,312

CLASS 370

58 4,257,119
62 4,257,120
104 4,256,925

CLASS 400

124 4,256,408

CLASS 401

24 4,256,409

CLASS 402

73 4,256,411

CLASS 403

267 4,256,412
282 4,256,413

CLASS 404

79 4,256,414
116 4,256,415
119 4,256,416

CLASS 405

195 4,256,417

CLASS 406

112 4,256,418
161 4,256,419

CLASS 408

115 R 4,256,420
221 4,256,421
241 S 4,256,422

CLASS 409

82 4,256,423

CLASS 410

105 4,256,424
149 4,256,425

CLASS 411

518 4,256,010

CLASS 414

24.5 4,256,426
77 4,256,427
121 4,256,428
428 4,256,430
505 4,256,431
626 4,256,429
694 4,256,432
4,256,433
786 4,256,434

CLASS 415

2 R 4,256,435
143 4,256,436

CLASS 417

45 4,256,437
53 4,256,438
216 4,256,439
391 4,256,440
407 4,256,441
477 4,256,442

CLASS 418

77 4,256,443

CLASS 422

4 4,256,728
7 4,256,691
46 4,256,692
56 4,256,693
58 4,256,694
62 4,256,695
72 4,256,696
104 4,256,697
122 4,256,698
166 4,256,699
177 4,256,700
197 4,256,783
242 4,256,701

CLASS 423

7 4,256,702
23 4,256,703
27 4,256,704
4,256,705
29 4,256,706
42 4,256,707
61 4,256,708
119 4,256,709
210 4,256,710
239 4,256,711
242 4,256,712
4,256,713
295 4,256,714
300 4,256,715
321 S 4,256,716
348 4,256,717
419 P 4,256,718
424 4,256,719
449 4,256,720
540 4,256,721
594 4,256,722
633 4,256,723

CLASS 424

1 4,256,724
4,256,725
4,256,726
1.5 4,256,727
5 4,256,729
52 4,256,730
54 4,256,731
91 4,256,732
114 4,256,733
177 4,256,735
4,256,736
4,256,737
180 4,256,738
200 4,256,739
4,256,740
4,256,741
244 4,256,742
247 4,256,743
248.51 4,256,744
248.54 4,256,746
248.55 4,256,745
250 4,256,747
251 4,256,748
4,256,749
253 4,256,750
258 4,256,751
263 4,256,752
4,256,753
269 4,256,754
272 4,256,755
273 R 4,256,756
4,256,757
274 4,256,758
4,256,759
279 4,256,760
282 4,256,761
283 4,256,762
285 4,256,763
4,256,764
315 4,256,765
319 4,256,766
324 4,256,767
333 4,256,768

CLASS 425

73 4,256,444
101 4,256,445
115 4,256,446
159 4,256,447
367 4,256,448
388 4,256,449

CLASS 426

72 4,256,769
124 4,256,770
250 4,256,771
331 4,256,772
415 4,256,773
428 4,256,774
508 4,256,775
535 4,256,776
637 4,256,777

CLASS 427

10 4,256,778
34 4,256,779
38 4,256,780
47 4,256,781
53.1 4,256,782
139 4,256,734
222 4,256,785
244 4,256,786

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1 4,256,787
35 4,256,788
4,256,789
73 4,256,790
77 4,256,791
119 4,256,792
137 4,256,793
195 4,256,794
196 4,256,795
210 4,256,796
215 4,256,797
4,256,798
4,256,799
216 4,256,784
245 4,256,800
280 4,256,801
310 4,256,802
315 4,256,803
332 4,256,804
357 4,256,805
378 4,256,806
379 4,256,807
421 4,256,808
473 4,256,809
550 4,256,810
562 4,256,811

CLASS 429

56 4,256,812
86 4,256,813
111 4,256,814
185 4,256,815

CLASS 430

11 4,256,816
17 4,256,817
39 4,256,818
41 4,256,819
54 4,256,820
59 4,256,821
62 4,256,822
66 4,256,823
122 4,256,824
142 4,256,825
213 4,256,826
215 4,256,827
280 4,256,828
312 4,256,829
372 4,256,830
562 4,256,831

CLASS 431

337 4,256,450

CLASS 432

14 4,256,451
225 4,256,452
235 4,256,453
241 4,256,454

CLASS 433

8 4,256,455
21 4,256,456
77 4,256,457

CLASS 434

82 4,255,873
308 4,255,872

CLASS 435

6 4,256,832
7 4,256,833
4,256,834
48 4,256,835
70 4,256,836
167 4,256,837
234 4,256,838
314 4,256,839

CLASS 455

89 4,257,121
91 4,257,122
115 4,257,123
601 4,257,124
608 4,257,125
619 4,257,126

CLASS 493

11 4,256,027
160 4,256,025
266 4,256,023
287 4,256,028
343 4,256,024
404 4,256,026

CLASS 521

33 4,256,840
51 4,256,841
53 4,256,842
4,256,843
59 4,256,844
61 4,256,845
117 4,256,846
4,256,847
124 4,256,848
129 4,256,849
139 4,256,850

CLASS 525

1 4,256,851
6 4,256,852
92 4,256,853
242 4,256,854
326 4,256,855
331 4,256,856
4,256,857
375 4,256,858
384 4,256,859
437 4,256,860
4,256,861
534 4,256,862

CLASS 526

62 4,256,863
4,256,864
124 4,256,865
142 4,256,866
263 4,256,867

CLASS 528

9 4,256,868
15 4,256,870
67 4,256,869
265 4,256,871
395 4,256,872
425 4,256,873
486 4,256,874

CLASS 536

4 4,256,875
12 4,256,876
59 4,256,877

CLASS 542

412 4,256,878
427 4,256,879

CLASS 544

106 4,256,880
132 4,256,881
212 4,256,882
235 4,256,883
240 4,256,884
313 4,256,885
323 4,256,886
333 4,256,887
334 4,256,888

CLASS 546

63 4,256,889
158 4,256,890
234 4,256,891
261 4,256,892
301 4,256,893
345 4,256,894
4,256,895

CLASS 548

160 4,256,896
183 4,256,897
240 4,256,898
246 4,256,899
262 4,256,900
268 4,256,901
365 4,256,902

CLASS 549

87 4,256,903

CLASS 560

104 4,256,904
119 4,256,905
121 4,256,906
124 4,256,907
204 4,256,908
4,256,909
209 4,256,910
227 4,256,911
248 4,256,912

CLASS 562

521 4,256,913
535 4,256,914
4,256,915
537 4,256,916
562 4,256,917

CLASS 564

18 4,256,661
67 4,256,662
135 4,256,665
4,256,666
177 4,256,664
188 4,256,663
255 4,256,668
384 4,256,667
416 4,256,670
422 4,256,671
434 4,256,669

CLASSIFICATION OF DESIGNS

D2—	275	258,545	D7—	47	258,558			258,570	D14—	11	258,585		62	258,597		86	258,608
	309	258,546	D8—	1	258,559		401	258,571		29	258,586	D20—	9	258,598		149	258,609
		258,547		57	258,560		412	258,568		73	258,587	D21—	17	258,599	D24—	38	258,610
		258,548		300	258,561		420	258,575	D15—	7	258,588		41	258,600		64	258,611
	323	258,549		323	258,562		432	258,574			258,589		76	258,582			258,612
	400	258,550	D9—	76	258,563		452	258,576			258,590		106	258,601	D25—	52	258,613
D3—	52	258,551		307	258,572	D10—	106	258,577		20	258,591		148	258,602		74	258,614
	76	258,552		315	258,573		121	258,578		27	258,592		159	258,603			258,615
D6—	32	258,553		338	258,565	D11—	4	258,579		53	258,593		225	258,604			258,616
	104	258,554		377	258,569		5	258,580	D17—	99	258,594		226	258,605			258,617
	146	258,555		383	258,564	D12—	62	258,581	D18—	24	258,595		230	258,606			258,618
	179	258,556		385	258,566		78	258,583	D19—	49	258,596	D23—	67	258,607			258,619
	201	258,557			258,567	D13—	02	258,584									

CLASSIFICATION OF PLANTS

P.—	2	4,669		14	4,670		18	4,671		27	4,672		39	4,673		41	4,674

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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